Amstar CORPORATION
Spreckels SUGAR DIVISION

SPRECKELS SUGAR BEET BULLETIN

Volume 35, 1971

AGRICULTURAL DEPARTMENT -- SPRECKELS SUGAR DIVISION

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(Continued on inside of back cover)

SPRECKELS SUGAR BEET BULLETIN

PUBLISHED AS A SERVICE TO CALIFORNIA AND ARIZONA SUGAR BEET GROWERS

Editorial

The 1970 sugarbeet crop was a 100-year crop in every sense and it establishes beyond a doubt that high levels of sugarbeet production are attainable.

Our ever-present challenge, however, is to be able to consistently achieve high levels of production. "Consistent" is the key word.

A high yielding crop is the collective result of a number of factors, most of which the sugarbeet grower can control. High yielding crops are consistently produced by growers who make use of the best information and who apply these principles in a timely manner to each phase of their cultural operations. The best information concerning the sugarbeet crop can come from the processor's field superintendent, from other growers, from published material, from extension personnel, and also from the grower's own experience.

The manner in which the grower applies this information and the techniques he consequently develops in growing the crop are aspects we hope to focus upon in this issue and in future issues.

If the Bulletin can provide sugarbeet growers with this pertinent kind of information, then it will certainly be fulfilling the prime purpose of its existence.

We would welcome any comments you might have relative to the type of information you would like to see in the Bulletin.

The Bulletin is now headquartered in San Francisco at the Spreckels Sugar Division's main office. With our move from Mendota to San Francisco now completed, we expect to again publish the Bulletin on a regular basis.

HONOR ROLL

The Fall 1971 issue of the Bulletin will contain the 1970 crop year Honor Roll. It will be the largest Honor Roll ever published in the Bulletin and all of those growers who attained this distinction are to be congratulated.

The Honor Roll presently contains each grower contract that produces 25 tons of sugarbeets per acre or more. The ranking, however, is on the basis of pounds of sugar produced per acre. Since sugar per acre is the true determinant of a given beet crop's value, beginning with the 1972 crop year, we are considering using the production of sugar per acre as the basis for qualifying growers for the honor roll instead of tons per acre. It is hoped that this concept will reflect the efforts of qualified growers in a more equitable manner.

The next issue of the Sugarbeet Bulletin will contain additional information on this proposed change.

An Honor Roll of Arizona growers will also be published for the first time in the Fall, 1971 issue of the Bulletin. It will cover the 1970 crop which was harvested this past Spring in Central Arizona.

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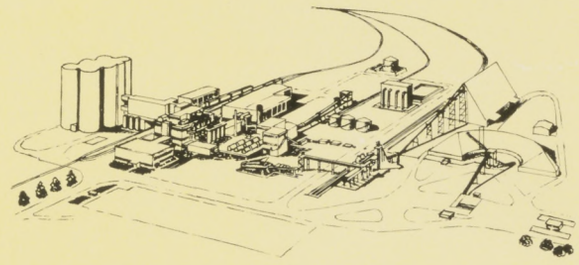
VOL. 35 SPRING & SUMMER NOS. 1 & 2



Spreckels Sugar Beet Bulletin is published quarterly by the Agricultural Department of the Spreckels Sugar Division, Amstar Corporation, as a service to its growers. Mention of specific methods, devices and implements does not constitute an endorsement by the publisher. Please address all communications to: Spreckels Sugar Beet Bulletin, 2 Pine St., San Francisco, California 94106. Please include your zip code.

Front Cover. Field Superintendent Larry Ellis is shown checking a young Salinas Valley beet field.

Back cover. A trainload of sugarbeets rounds a curve in Niles Canyon near Fremont, California, enroute to the Salinas factory. Each car contains 70 tons of sugarbeets and some trains contain up to 100 cars, or 7,000 tons of sugarbeets. Southern Pacific Corporation hauls more sugarbeets than any other agricultural commodity. Last year Southern Pacific hauled in excess of 40,000 carloads of sugarbeets.

The Printer, 707 2nd Street
Davis, California 95616

DISEASES OF SUGAR BEETS

CENTRAL SAN JOAQUIN VALLEY

DISEASE	HOST	CARRIER (VECTOR)	RETENTION OF VIRUS BY VECTOR	CONTROL MEASURES
Curly Top	Russian thistle goosefoot	Beet Leafhopper	Life	Thimet-preplant 5"-6" under seed
Beet Yellows	Sugar beet (pigweed, atriplex, goosefoot, spinach)	Aphids green peach	3-4 days	**Eliminate source by:** 1. Sanitation—destroy ground keepers and seedlings 2. Clean-up after harvest 3. Beet-free period 4. Control weeds 5. Date of planting 6. Minimize bolting (cut seed stalks) 7. Resistant varieties
Beet Mosaic	Sugar beet (pigweed, sour clover, lambsquarter family)	Aphids green peach	Hours	
Western Yellows	Sugar beet (broccoli, lettuce, flax, radish, mustard, atriplex, goosefoot, shepherds purse, prickly lettuce, cheeseweed, London rocket, etc.	Aphids green peach	Life	

An Urgent Message To Sugarbeet Growers

By Lauren M. Burtch and Bill B. Fischer

Lauren M. Burtch is Chief Agronomist, Spreckels Sugar Division, Mendota, California and Bill B. Fischer is a Farm Advisor, Fresno County.

The sugarbeet crop throughout California in 1972 was, to say the least, outstanding in both root yield and sugar content. The combination of the highest per acre yields in history plus the large acreage resulted in a prolonged harvest in many areas. As a result, sufficient time was not afforded in some areas to clean the fields completely by destroying all the beets or pieces of beets commonly referred to as ground keepers. These roots or pieces of roots remaining after harvest harbor virus organisms, and if not destroyed they can serve as a source of inoculum for the infection of newly planted beets.

Due to the extended harvest and to the practice of planting the next crop before all old beets were cleaned up, true "beet free periods" were not obtained in some areas. As a result these areas are experiencing relatively high levels of virus infection and depressed yields this year.

A true beet free period exists when planting of the next sugarbeet crop is delayed for at least 30 days after the completion of the current crop harvest and all ground keepers have been completely destroyed. This break allows growers to destroy all tops, crowns and beets which have escaped harvest, which in turn destroys the ability of the green peach aphid to transmit beet yellows virus or beet mosaic to the next crop.

These two diseases are aphid borne and can only be retained in the body of the aphid for a maximum of four days. A truly effective break of 30 days or more between the clean up of fields behind harvest and the planting of the next crop should thereby minimize the threat of beet yellows or beet mosaic. Winged aphids under favorable conditions can be wind borne for several miles. A minimum of a ten mile buffer is recommended between newly planted fields and any unharvested or uncleaned fields during peak winged aphid activity. This peak extends from September to early November in the Fall and from mid-March to about May 1 in the Spring.

It must be realized that the success of a sanitation program depends on the thoroughness of the clean up and the cooperation of all parties including sugar company personnel, and growers. The job will not get done if left to the other guy.

Sugarbeets have a remarkable ability to survive, and a single discing is seldom sufficient to destroy them even in warm weather. Crowns by themselves can root wherever moisture exists and pieces of crown can give rise to new tops through several inches of soil. Since the virus lives in the beet, all living parts of the beet must be destroyed to eliminate that beet as a source of new crop infection.

The chart above outlines the important diseases, their hosts, vectors and control measures. Thoroughly familiarize yourself with this material and if

(Continued on page 9)

Minimizing Hand Labor In The Salinas Valley

By Lawrence W. Ellis

Mr. Ellis is a Field Superintendent in District I, Salinas. He serves in the Salinas, Chualar and Greenfield areas.

Stand or space plantings in combination with herbicides have effectively reduced high labor costs in the Salinas Valley. These beets were planted at an 8 inch spacing.

Present labor costs and the threat of UFWOC unionization have forced Salinas Valley beet growers to experiment with stand plantings and space plantings for mechanical and/or electronic thinning. These same reasons have forced growers to rely upon herbicides for weed control. Stand or space plantings in combination with herbicides can effectively reduce high labor costs.

Spreckels Sugar Division has 5,000 acres of sugar beets contracted in the Salinas Valley between the towns of Chualar and Greenfield. Of these 5,000 acres, 44 percent were planted to a stand (4" - 6" spacing), 28 percent were space planted (2¼" - 3⅝") for mechanical blockers or electronic thinning. The remaining 28 percent were planted 1" - 2" and were thinned by hand labor.

Space planted acreage was thinned as expected with the only exception being those fields that were too weedy to use the electronic apparatus. Most growers planting to a stand at 4" found they had too high a plant population for a final stand, yet not enough plants to justify use of a random blocker or selective thinner. Growers planting at 6" have found their stands a bit on the lean side with some large skips, but have kept them.

Of those acres planted to a stand in this area, 39.6 percent did not require thinning. This 39.6 percent is composed of fourteen growers and 1,984 acres.

SEED SPACING

Field selection, seed bed preparation and planting dates will in most cases determine which spacing is suitable for an individual grower. Some fields may not tolerate a 5" or 6" spacing. Late winter and early spring plantings must contend with crust and birds, among other things. Much thought must be given to these factors before selecting seed spacing. General consensus at this time, however, favors two possible options. Space plant at 3" and use electronic thinners or mechanical blockers, or stand plant at or near 5". Many are of the opinion that anything less than 3" spacing seems to reduce the effectiveness of the electronic thinner.

Good weed control is always necessary for best yields, and essential for growers intending to use electronic thinners.

HERBICIDES

The banding of Pyramin on a post-plant, pre-emergence basis was used to a great extent this year. Good cultural practices, proper application and incorporation of this herbicide aid in minimizing the effects of uncontrolable variables, and often determine the success or failure of the herbicide. Improper incorporation resulted in many failures this year.

Growers considering banding Pyramin on a post-plant, pre-emergence basis must be reminded of the importance of the initial irrigation. Adequate and uniformly applied sprinkler water is essential for proper incorporation.

Other post-emergence herbicide applications are available to growers. These should be considered when determining which herbicide is best suited for your conditions.

It is hoped that the experience gained this year will provide insight for selecting proper planting and herbicide combinations for the 1972 crop.

Integrated Weed Control In Sugarbeets

By Dale R. Comer

Mr. Comer is an Agronomist for Spreckels Sugar in the Southern San Joaquin Valley. He is headquartered in Mendota, California.

Weeds can reduce a grower's profit substantially by lowering yield and quality while increasing harvest and processing costs. Weeds not only compete with sugarbeets for nutrients, water and light, but also harbor insects, which can carry diseases.

The first six to eight weeks following sugarbeet emergence is considered to be the most critical period for eliminating weed competition. Once a canopy is formed by the beet leaves, the effect of shading will normally suppress the germinating weeds. Studies with uncontrolled watergrass have shown a reduction in sugarbeet yields of 20 to 45 percent depending upon the infestation.

The development of selective herbicides has helped make the complete mechanization of sugarbeet production possible. With the rising cost of labor, growers are finding it more economical to integrate their weed control program by combining chemical and mechanical means. Since none of the selective herbicides registered will control all of the weeds found in sugarbeets, good management practices such as proper field selection and use of chemicals must be followed.

ANTICIPATE PROBLEMS

Some other recommended practices are: (1) to rotate beets with intertilled crops to reduce the potential of the weed infestation, (2) know what kind of weeds to expect so that an effective plan of herbicide selection and timing can be initiated for the local conditions, (3) pre-irrigate prior to planting when following crops such as barley, wheat or safflower, (4) utilize several well timed cultivations for controlling weeds, (5) and, of course, good seed bed preparation free of trash and clods will facilitate the application of soil applied herbicides.

Before considering a weed control program, we must first determine the kind of weeds we are trying to control and the time of year they are a problem. A chart of some of the more prevalent weeds along the West Side of the San Joaquin Valley is shown on pages 6 and 7. The winter annual broadleaf and grassy weeds such as chickweed, mustard, london rocket, shepherds purse, red maids, fiddleneck, rabbits foot and canary grass can be controlled effectively by pre-emergence or early post emergence herbicides.

Summer annual weeds such as pigweed, knotweed, lambsquarter, purslane, nightshade and barnyard grass are extremely difficult to control after emergence so an effort should be made for pre-emergence control.

Growers planting during the period of October to January can control most winter annual broadleaf weeds with a pre-emergence application of Pyramin. Pyramin has shown to be most effective when incorporated by sprinkler irrigation or rainfall. Mechanical incorporation can be used, but some sugarbeet damage has been observed with this method.

Winter grass control has been extremely difficult to obtain. Grass control in Fall planted beets has been enhanced by combining TCA with Pyramin. This combination is good on fine seeded grasses, but TCA is weak against wheat, barley and oats. IPC is very effective on grains but injury to beets has been severe when applied pre-emergence. In Arizona and the Imperial Valley, IPC has given excellent post-emergence control of barley when the application was followed with furrow irrigation.

POST EMERGENCE APPLICATIONS

Post emergence applicatóns can be successful on winter annual weeds with effective timing of applications. For best results, post emergence herbicides should be made when beets are in their 2 to 4 leaf stage and before weeds reach the 4 leaf stage. The control of volunteer grains has been the main obstacle in attaining effective winter annual weed control. In heavier soils where conditions prohibit ground equipment, split aerial applications of Dalapon may be applied to retard weed growth. A possible break through of winter grass control was last years success with Endothal and a wetting agent. Where this combination was flown on commercially, control of barley and wild oats was excellent. For rates and further information concerning this combination, growers should consult their field superintendent.

Pyramin and Betanal are very similar in their spectrum of weed control. Several factors should be considered before selecting either of these materials. Pyramin for instance, has a longer residual and is slower acting. When applying Pyramin-Dalapon post emergence, control is best with 75-100 gals. of water per acre with an irrigation following application.

Betanal provides a more rapid kill than Pyramin but has no effective residual control. Used in high gallonages, Betanal has shown to precipitate and therefore is recommended with no more than 35 gals. per acre or diluted, 3 quarts of Betanal in 30 gallons of water. Soil moisture does not appear to influence the weed control potential of this herbicide, however an irrigation following application has improved beet safety.

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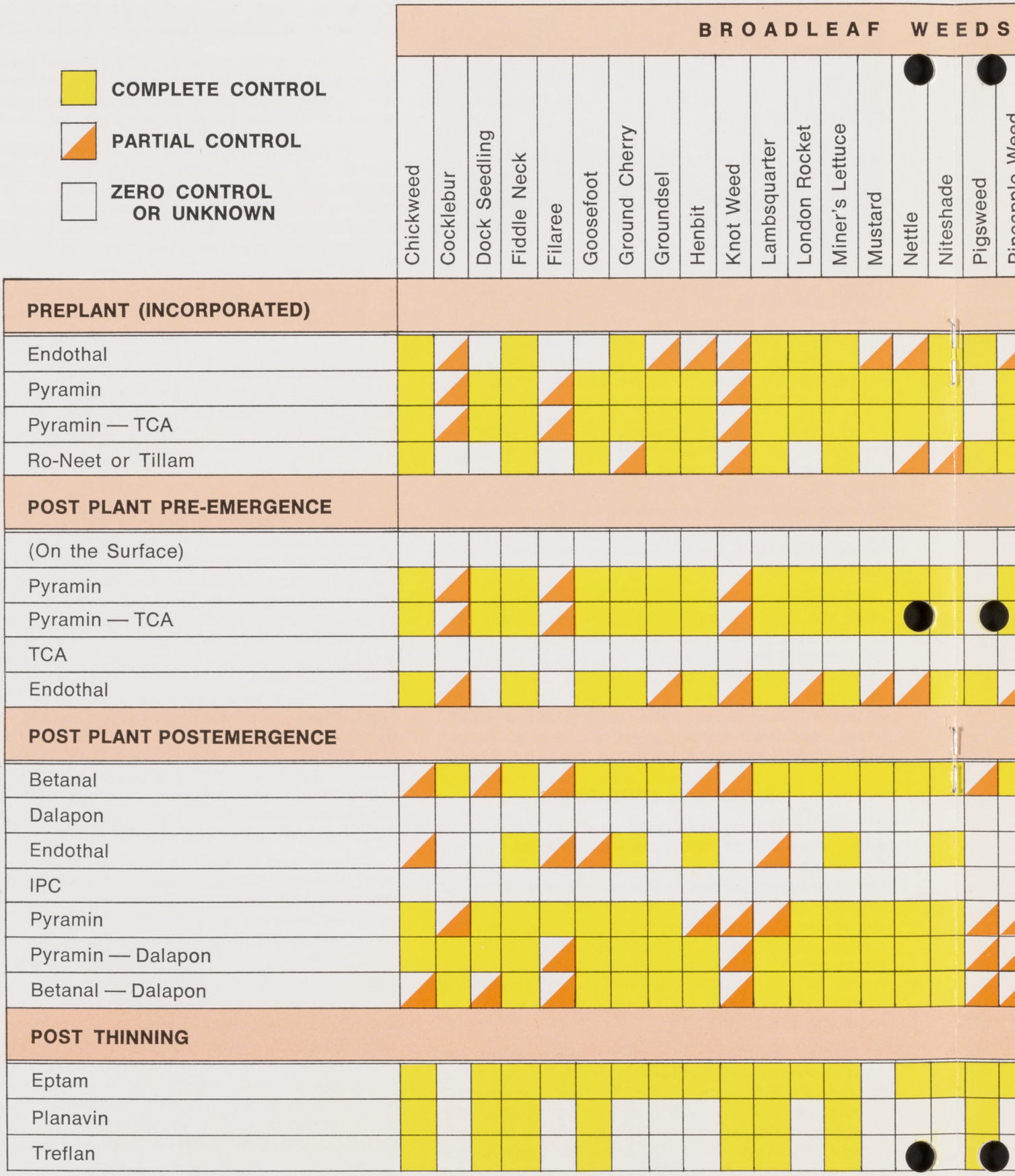
CHEMICAL WEED CONTROL GUI

COMPLETE CONTROL

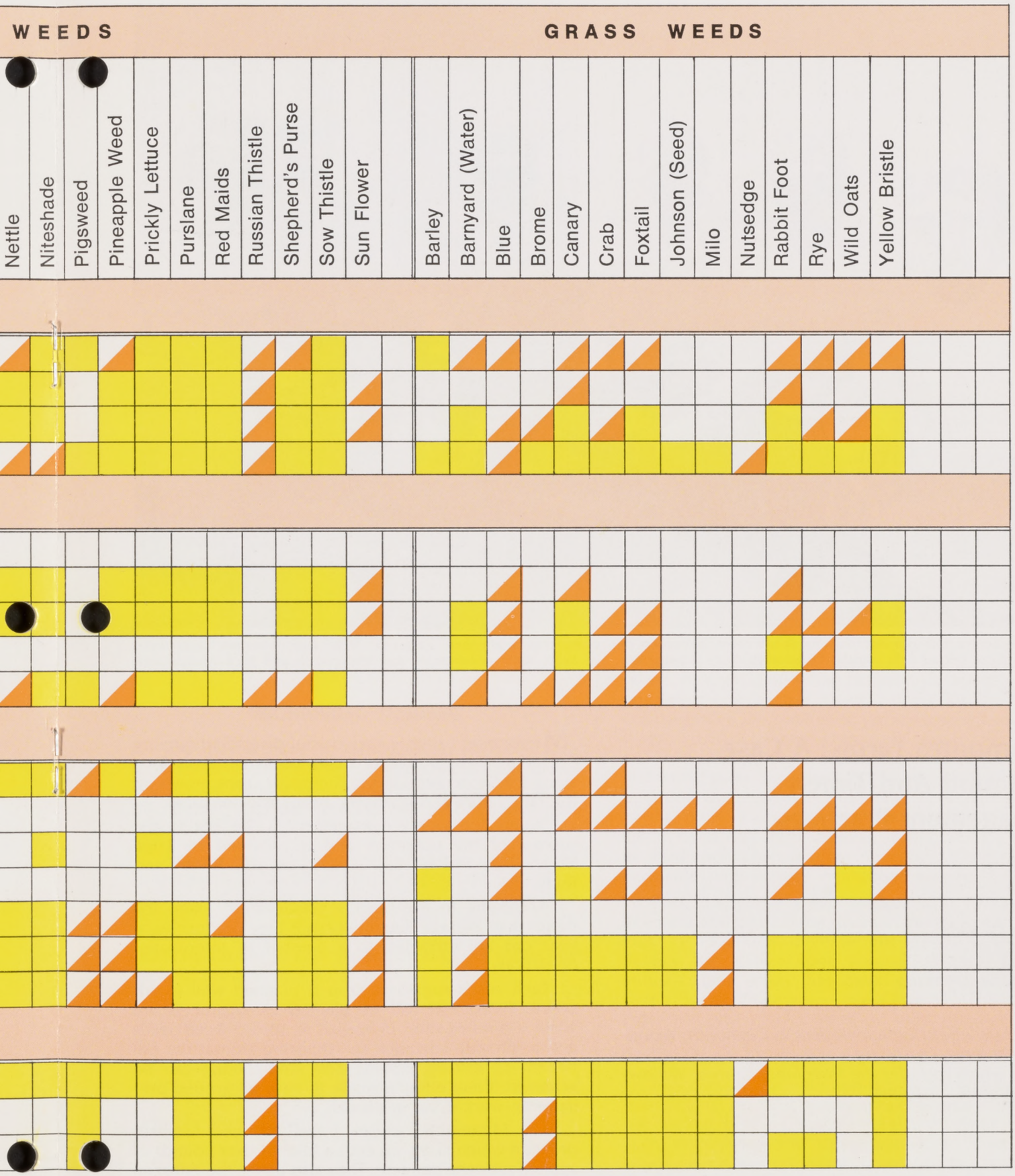
PARTIAL CONTROL

ZERO CONTROL OR UNKNOWN



* This chart was prepared by Dale R. Comer and Richard P. Heimforth, Agronomist and Field Superi as a guide for the selection and use of herbicides on specific weeds. Results will depend up mation in the chart was compiled from observations of research plot work and commercial field information consult the herbicides label and your field superintendent.

OL GUIDE FOR SUGARBEETS



and Field Superintendent respectively, Spreckels Sugar Division, Mendota, California. It is intended
s will depend upon the timing of the application and how vigorous the plants are growing. Infor-
commercial field applications in the Southern San Joaquin Valley. For specific rates and other

The Miramontes management team is shown here discussing this years crop with their Spreckels Field Superintendent, Lee Seda. Pictured from left to right, Bobby Miramontes, Lupe Miramontes, Lee Seda, Rudy Miramontes, Joe Miramontes and Nick Miramontes.

Miramontes Farms; A Case Of Sound And Timely Management Practices

By Lee O. Seda

Mr. Seda is a Field Superintendent in District III, Woodland. He serves in an area northwest of the Woodland factory which includes the Josephine, Grimes, Willows and Arbuckle areas.

Miramontes Farms is a successful diversified farming operation located twenty miles north of Woodland along the Sacramento River. The major crops grown on the ranch include sugarbeets, beans and tomatoes.

Sound and timely management is the key to the success of the operation and is provided by Lupe Miramontes and his four sons, Nick, Joe, Robby and Rudy.

According to the ranch's management team, the better than average sugarbeet crops they produce each year can be attributed to a number of interrelated operations.

Each year's sugarbeet crop is planned well in advance. Fields that will be planted to sugarbeets are given a pre-irrigation in August to sprout weed seeds and to provide adequate soil moisture so that the full benefit of discing, ripping and land-planing can be achieved. Every effort is made to have all ground preparation work done in the fall.

The Miramontes utilize a well planned fertilizer program which rarely exceeds a total of sixty pounds of applied nitrogen per acre. They also utilize the nitrogen

Precision cultivation reduces the Miramontes hand labor costs very significantly.

strip technique to make certain they do not over or under fertilize.

Planting begins in early spring and their seeding rate is held to six seeds per foot or less so that their John Deere electronic thinner can be used to best advantage.

Weed problems are anticipated as best as possible, and when a problem is expected, an herbicide program is used which normally consists of pre-plant, power incorporated Tillam or RoNeet.

If aphids are present after their sugarbeets emerge, a spray program is initiated, using Meta-Systox R. The timing of the applications is very important if the desired control is to be achieved.

MECHANICAL THINNING

Just prior to thinning, the sugarbeets are rolled with a flat roller which provides a smooth flat surface for the mechanical thinner to work on. For the last few years, all of their sugarbeet acreage has been thinned mechanically.

A precision cultivation with a cone guided sled immediately follows the thinning operation. The Miramontes feel that the very narrow band they leave (two inches) greatly reduces their hand weeding costs. Cultivation is followed by a rolling operation using a reink type roller to firm the soil around the plants and to help preserve moisture.

Once the sugarbeets are laid-by, a very timely irrigation program is followed, with frequency being the most important consideration. Depending upon soil type, their sugarbeets receive an irrigation once every ten days during the warmer months. One of their most important irrigations comes as soon as possible after lay-by.

AN URGENT MESSAGE

(Continued from page 3)

you have any questions consult your field superintendent. It would be adviseable to teach your employees to recognize sugarbeets growing where they are not supposed to be, as along ditches, roads and in fields planted to other crops. Seek these beets out and destroy them especially before they produce a seed stalk and set any seed.

High production years as 1970 can be repeated, but only if we take the aforementioned steps and maintain beet pree periods. It's up to you and the next guy!

INTEGRATED WEED CONTROL

(Continued from page 5)

Beets planted between February and May emerge with summer annual weeds such as pigweed and watergrass and so pre-emergence weed control should be considered. Ro-Neet has worked very well in this area incorporated 3 to 4 inches deep with a power-driven rotary tiller immediately following application. Ro-Neet and Tillam have short residual properties (generally 4 to 8 weeks) so a layby application is necessary to carry the beets through the growing season.

The layby herbicides Treflan, Planavin or Eptam may be required for either Fall or Spring planted beets, since both may become infested with summer annual weeds. Incorporation of Treflan or Planavin with the Lilliston is essential immediately following application. Weed control with these materials is effective only pre-emergence to the weeds. Some of the weeds not controlled are cocklebur, ground cherry,hairy night shade, maristail, prickly lettuce and sow thistle. Eptam will control all of these weeds except cocklebur. Control with Eptam has been best when injected into the irrigation water following thinning. Thorough subbing of the beds is essential to obtain adequate control. Eptam has a very short residual, consequently a second or third application is often necessary. None of these herbicides will control established weeds.

Post emergence weed control with Pyramin has been less effective on the summer annual weeds. When night temperatures increase and growth is vigorous, Betanal has shown good control on most summer annuals. Beet injury has been observed with both herbicides as temperatures rise above 85°. These herbicides will give good control on most summer annual weeds if applied early but they are weak on Russian thistle, knotweed, lettuce and watergrass.

In summary, Pyramin appears to be slightly better than Betanal on most winter annual weeds while Betanal looked best on early emerging summer annuals such as pigweed and lambsquarters. In some areas, where weeds were resistant or escaped the herbicides, they were controlled by timely cultivation.

BILL DUCKWORTH TO SALINAS

William R. Duckworth, formerly Agricultural Superintendent in District III, Woodland, has been transferred to District I, Salinas, in the same capacity.

Bill joined Spreckels Sugar in 1948 as an Assistant Field Superintendent in the Salinas and Woodland areas. In 1949, he was made a Field Superintendent in the Woodland area and in 1962 was promoted to the position of Agricultural Superintendent.

He is a native of Salinas, California, and attended the University of California at Berkeley where he majored in Agricultural Economics. He is a member of Alpha Zeta, a national honorary agricultural fraternity and a past member of the Woodland Chamber of Commerce. He also served four years in the U. S. Army as a 2nd Lieutenant.

Bill, his wife, Nell, and their family now reside in Salinas.

ROGER McEUEN TO WOODLAND

Roger S. McEuen, formerly Assistant to the Agricultural Manager in San Francisco, was recently designated to replace Bill Duckworth as Agricultural Superintendent in District III, Wodland.

Roger joined Spreckels in July, 1962, as an Assistant Field Superintendent in the Manteca District. He was subsequently made a Field Superintendent and served in the Isleton, Walnut Grove and Collegeville areas. He was transferred to Arizona in 1965, where he served in an area west of Phoenix, and in 1968 he was promoted to the position of Assistant to the Agricultural Manager and transferred to the Division's headquarters in San Francisco.

He is a native of Hanford, California, and attended the University of California at Davis, where he majored in Agronomy. He served four years in the U. S. Army as a Company Commander of an aviation troop. He is also a member of the Commonwealth Club of California.

Roger, his wife Christina, and three children now reside in Woodland.

GERALD NORDSTROM TO SAN FRANCISCO

Gerald G. Nordstrom was recently promoted to the position of Assistant to the Agricultural Manager and transferred to the Spreckels Division headquarters in San Francisco. He formerly served as a Field Superintendent in District IV, Mendota.

He joined Spreckels Sugar Company at Woodland in August, 1962, as an Assistant Field Superintendent. In December of that year he was made a Field Superintendent and transferred to District IV, Mendota. In 1967, he was appointed Editor of the Spreckels Sugar Beet Bulletin, along with his field responsibilities. He will continue as Editor of the publication at his new location.

Gerald is a native of Dos Palos, California and attended the University of California at Berkeley, where he majored in Agricultural Economics. He is a member of the Commonwealth Club of California, the American Society of Sugar Beet Technologists, the Agricultural History Society, and a former member of the Agri-business Committee of the Fresno City and County Chamber of Commerce.

Gerald, his wife Jeannette, and three children now reside in Danville, California.

NEW ADDITION TO RESEARCH STAFF

Dr. Charles E. Stanger, Jr., has joined Spreckels' Research Staff as a Research Agronomist in District V, Arizona.

Charles is a native of Burley, Idaho, and attended Utah State University, where he majored in Crop Science. He was awarded his Master's and Doctorate degrees in Herbicide Science from Oregon State Uni versity.

He is a member of Phi Kappa Phi, the Phi Sigma Society, and the Society of Sigma Xi. He received an award from the Phi Sigma Society, and a leadership award from the American Society of Agronomy. He also served in the U. S. Navy as a Radarman.

Charles, his wife Deon, and five children now reside in Mesa, Arizona.

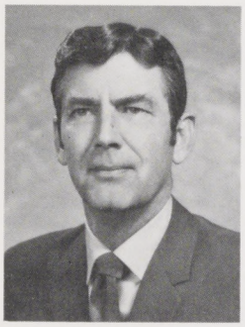
NEW POSITION FOR JAY HILL

Jay N. Hill was recently appointed to the newly created position of Farming Superintendent for the Fall harvest areas in District V, Arizona. Jay formerly served as a Field Superintendent in the Willcox area, where he will continue to make his headquarters.

He is a native of Modesto, California, where he attended Modesto Junior College. He also attended the University of California at Davis, where he majored in Plant Nutrition. Upon completion of college, he served two years in the U. S. Navy.

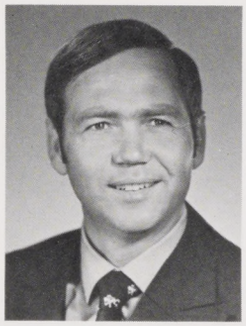
Jay joined Spreckels Sugar in 1959 as an Assistant Field Superintendent in District III, Woodland. He was promoted to Field Superintendent in 1960 and transferred to District I, Salinas, where he served in the Soledad area. In 1963, he was transferred back to Woodland as a Field Superintendent, and in 1965 he was transferred to Arizona, where he served in the same capacity.

Jay and family reside in Willcox, Arizona.

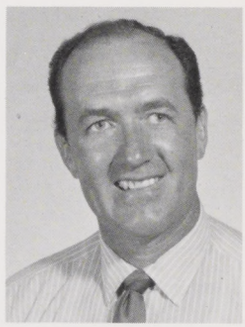


Bill Duckworth

Roger McEuen



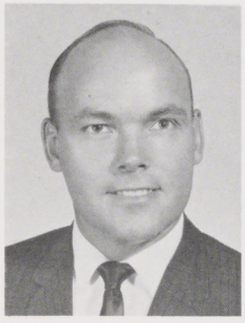
Gerald Nordstrom



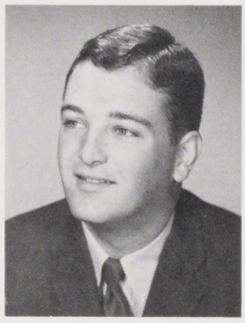
Charles Stanger

Jay Hill

Mike Daugherty



Denzil Farbo



Paul Hoag

MIKE DAUGHERTY PROMOTED

Michael T. Daugherty has also been named a Farming Superintendent in District V, Arizona. Mike formerly served as a Field Superintendent in an area southwest of Phoenix. In his new capacity, Mike will supervise company farming of the Gila River Ranch.

Mike joined Spreckels Sugar in January, 1961, as an Assistant Field Superintendent in District III, Woodland. In February 1962, he was promoted to the position of Field Superintendent and served in the Woodland area. In March, 1966, he was transferred to Arizona.

He is a native of Southern California and attended the University of California at Davis, where he majored in Agronomy. He also served four years in the U. S. Army as a First Lieutenant.

Mike, his wife Mary, and three children reside in Tempe, Arizona.

DENZIL FARBO PROMOTED

Denzil H. Farbo, formerly Field Superintendent in the Lordsburg, New Mexico area, has been appointed to the newly created position of Machinery Superintendent for District V, Arizona. In his new capacity, Denzil will asume responsibility for all of the company's agricultural machinery in Arizona. He is now headquartered in Willcox, Arizona.

He is a native of Cando, North Dakota, and a graduate of North Dakota State University, where he majored in Agricultural Engineering.

Denzil joined Spreckels Sugar in January, 1967, as an Assistant Field Superintendenlt in District V, Arizona. He is a member of the American Society of Agricultural Engineers and the Elks Club. He served as a Radar Technician in the Air National Guard.

Denzil, his wife Mary, and two children reside in Willcox.

STAFF ADDITION AT MENDOTA

Paul W. Hoag recently joined the Spreckels Agricultural Staff in District IV, Mendota. As an Assistant Field Superintendent, Paul will work with the agricultural research and field staffs.

He is a native of King City, California, where he attended local schools. He attended the University of California at Davis, where he majored in Agricultural Business Management.

Paul and his wife Valerie now reside in Fresno.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SPRECKELS SUGAR BEET BULLETIN

PUBLISHED AS A SERVICE TO CALIFORNIA AND ARIZONA SUGAR BEET GROWERS

Staff Editorial

"I have often thought how many growers could be so foolish as to not follow the advice their fieldmen gave them on the best way to produce a crop of beets. Well, after reading an article entitled "Should crop Doctors Be Licensed?" in the Crops and Soils magazine, I can understand why. The article describes a crop doctor as one who diagnoses crop production problems, and on the basis of his tests and observations, makes recommendations for the grower to follow. The article pointed out that if a poorer than average yield is the problem the crop doctor who represents a fertilizer company is prone to believe that lack of nutrients caused such yields; or a doctor representing a chemical company may honestly believe that the problem is related to a disease or insect. Those representing seed companies may feel that the problem is genetic and a crop doctor trained as a research soil physicist but employed by the cooperative extension service as a county agent or an extension specialist may interpret a situation as being related to the physical condition of the soil. Entomologists and pathologists also fit in a similar manner into the situation. So, I guess being hit with all the recommendations by these "crop doctors" the poor farmer is liable to look upon a fieldman's advice with skepticism. Yet many growers do want professional advice and probably most growers need some professional advice.

Most probably a low yielding or poor quality crop could be improved by practicing the advice given by one, some, or all of these professionals. This is where the sugarbeet fieldman should be the best source of advice to a grower for the best production of a sugarbeet crop. It is the fieldman's business to keep up with all problems associated with growing sugarbeets.

However, I feel it might be hard at times for a sugarbeet fieldman to be completely unbiased with all crop production influencing factors. For example, if I have been reading a lot recently on inherent soil problems and discussing these influences with professionals in that field of work, I might lean toward just soil problems as a diagnosis for a poor yielding or quality crop, forgetting at the moment all the other influencing factors. Thus, the sugarbeet fieldman, much like a grower, also has all these "crop doctors" working on him either through the reading of their research work or talking directly with the specialist themselves. Their influence can work on a fieldman just the same as on a grower.

The fieldman is caught up somewhere in the middle. The researcher, salesman, fieldman and grower are all interested to some degree in producing a better crop. However, the researcher is only interested in crop improvement in his specialty area and the salesman is interested in improving the crop by the

(Continued on page 24)

SPRECKELS SUGAR BEET BULLETIN

PUBLISHED AS A SERVICE TO CALIFORNIA AND ARIZONA SUGAR BEET GROWERS

VOL. 35 FALL & WINTER, 1971 NOS. 3 & 4

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Cover. John Nielsen, District Agricultural Engineer for Spreckels Sugar is shown inspecting one of the first beets to pass over the new Helm receiving station. (See article on page 15)

The Printer, 707 2nd Street
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This photo, taken at the Woodland factory, shows one of the two new high capacity Silver pilers purchased by Spreckels Sugar in 1971. The second piler is located at the Manteca factory. Each piler has a capacity of 400 tons per hour or 4,000 tons per 10 hour day.

New Receiving Facilities Will Increase Harvest Efficiency

As part of a continuing program to increase the efficiency of its beet receiving facilities, Spreckels Sugar completely modernized two outside receiving stations and installed two new high capacity pilers this year.

Pilers — The two new pilers which were installed at the Woodland and Manteca factories each have a capacity of 400 tons per hour, or 4,000 tons in a ten-hour day. Built by C.F. & I. Engineers, Inc., of Denver, Colorado, the self-propelled pilers feature a 75-foot stacking conveyor, a 16-roll grab-roll screen and a semi-automatic sampling device. The pilers will be used during the late fall and spring campaigns and their additional receiving capacity should mean an even more orderly and efficient harvest for growers in those areas.

Helm — The Helm beet receiving station which is located approximately 30 miles southeast of the Mendota factory was completely modernized under the direction of John Nielsen, District IV Agricultural Engineer. The new station has a capacity of 300 tons per hour and its railroad siding has enough space for 60 rail cars. Other features include new troughing conveyor belts, an improved cleaning screen design, a 70-foot truck scale, a shuttle conveyor which allows the station to load both rail cars and truck transports, and a one-way traffic pattern which is a real convenience for truck drivers.

Elsa — A new receiving station was completed this past fall at Elsa, which is situated one and a half miles north of King City in the Salinas Valley. According to District I Agricultural Engineer Robert McGregor, the new station has a capacity of 300 tons per hour which represents a 100-ton per hour increase over the old station. The station has enough track capacity to load 35 rail cars per day. The Elsa receiving station site is one of the oldest in the industry, the original station being built in the late 1890's.

Ernie Skaggs (left) has a three year production average of 34.44 tons per acre and 16.16 percent sugar on better than 300 acres. His five year production average isn't much less. Ernie is pictured here with Spreckels Field Superintendent, Jack Griffin.

ERNIE SKAGGS

The Production Technique Of A High Yielding Grower

How can I consistently produce high yielding crops of sugarbeets? Many growers have often asked themselves this question and are continually searching for ways to achieve that end. This article is one in a series in which we hope to focus upon some of the techniques used by growers who have attained that goal.

One such grower is Ernie Skaggs who owns and operates the Santa Rita Ranch Company located on Highway 152 just north of Dos Palos, California. The ranch consists of some 1800 acres which is cropped to sugarbeets, cotton, corn and alfalfa.

Ernie has grown sugarbeets for the last ten years and generally plants his beets in April and May and harvests them the following spring. The last three years he has grown an average of 300 acres which has yielded an average of 34.45 clean tons per acre and 16.16 percent sugar for a sugar yield of 11,144 lbs. per acre. How does he do it? Some of his basic thoughts in answering this question include: (1) when faced with rising production costs, maximum production must be sought for each crop (2) avoid making the mistake of reducing or eliminating an expenditure or operation if it will hurt the crop. (3) weed control is one of his best returning operations. (4) planting and achieving a stand are the toughest parts of raising sugarbeets and consequently demand a great deal of attention and (5) the crop must be "pushed" as much as possible so that a good rate of growth is maintained throughout the season. This can be done by performing field operations as rapidly as possible and restoring adequate moisture to the field.

Some of the specific techniques Ernie uses in raising his sugarbeets are outlined by operation on the adjoining page.

Although he devotes a great deal of time to his farming operation. Ernie also takes time to participate in his community. He has served a total of sixteen years on the school boards of the Dos Palos Grammar School and Dos Palos High School. He recently completed his last term on the high school board as President. He has also served as a member and President of the Board of Directors of the San Luis Canal Company and is a former County Committeeman of the Merced County Agricultural Stabilization and Conservation Service.

Techniques By Operation -- Spring Harvested Sugarbeets

Rotation — The sugarbeets are grown in rotation with cotton, corn and alfalfa and usually follow cotton. They are planted in any given field only once in four years or more to prevent the establishment of sugarbeet nematode and certain rot diseases.

Outstanding corn production has been achieved following sugarbeets. Two key factors are (1) the use of zinc sulfate (about 200 lbs. per acre) and the use of a Howard rotovator to break up clods after plowing and discing the beet ground (The rotovation insures a good seed bed).

Ground Preparation — As soon as the cotton has been picked, the stalks are cut and the medium to heavy textured soil is disced twice then Cook plowed 14 to 15 inches deep (tries to stay above mud layer). Plowing at deeper depths is avoided to prevent bringing up accumulated salts. The ground is floated when required.

Bed Preparation — Listing of the 40 inch double row beds (27" x 13") is done in the spring since fall listed beds have to be re-worked and in the process their spacing is altered.

A deep furrow is established at listing time and is maintained throughout the growing season to "help grow the beets out of the ground." This practice keeps surface water off of the tops of the beds and away from the beets which minimizes weed and rot problems. The deep furrows are especially advantageous when an un-detected low spot shows up in the field and when old leaves begin to fall into the furrows and hamper irrigation.

Stand Establishment — This is the toughest part of raising sugarbeets. The first irrigation consists of a 24 hour set with the water being pushed through initially and then cut back. The second irrigation is also a 24 hour set and emergence usually begins upon its completion. The third irrigation follows not too far behind and is an important one since it helps assure a good stand and sizes the young beets which in turn enables them to go through cultivation and thinning in much better shape. During the first set, 2 pipes are used in the rows over which no tractor tires ran to make the water flow evenly in all furrows. If the water is allowed to run ahead in one furrow salt is pushed to one side of the bed and creates stand problems in that row.

Planting — An additional man is with the sled at all times to make certain everything is functioning properly. A Marvin sled is used and is equipped with International 185 planter units which plant the seed ¾ of an inch deep and 2¼ inches apart. The sled is also equipped with bed shapers in front and roller spools which follow the planters. The spools help stabilize the sled and firm the beds.

Fertilizer — Soil tests are taken each year to determine any requirements for phosphate, potash or minor elements. Sulphur is occasionally used to correct a pH problem. The tests are not used to determine nitrogen requirements.

Approximately 150-160 lbs. of nitrogen is generally used and is applied during the listing operation. Side dressing is avoided because of the growing time lost in drying out the field for the application. Once a canopy of leaves has developed the beets are observed twice a day to try and detect any color or vigor difference induced by lack of nitrogen. If any additional nitrogen is required it is applied in the water and is never applied after mid September.

As the land is farmed more intensely, phosphate requirements have gone up.

Herbicides — Watergrass, pigweed, nightshade, careless weed and lambsquarter are the most common weeds. Tillam is power incorporated just prior to the planting operation. During the second irrigation Eptam is run in the water and again extreme care is taken to make certain the rows are even. The beets are maintained weed free even into September and October.

Insects — Thimet is applied topically in the Spring for beet leaf hopper control. The timing of the application is critical.

Cultivation —After emergence the beets are generally rolled with a Reink and a smooth roller. Split rollers are used to maintain even beds. The beets are cultivated once leaving about a 1½ to 2 inch band. Another cultivation is carried out immediately after the hand crew spaces the beets about 10 inches apart. The center of the bed is rolled while cultivating to keep it firm. This prevents it from becoming saturated during irrigation and thus reduces the amount of weed seed that might germinate.

Irrigation — Stressed beets mean tons lost and frequency of irrigation is more important than quantity. The first irrigation after thinning is very important from a growth standpoint and can't come too fast. During the summer a continuous head of water (low volume) is kept in the beets and they are irrigated about every seven days. Late spring and fall are periods when good rates of growth can be achieved -- make certain the beets are wet. Irrigation continues through October and November.

ARIZONA

Disease And Weed Control Progress In Sugarbeets

The following article was prepared by Laurn M. Burtch, Chief Agronomist, Spreckels Sugar Division, Mendota California and Dr. Charles E. Stanger, Research Agronomist, Spreckels Sugar Division, Chandler, Arizona.

The 1971 summer and fall harvest in Arizona was most encouraging, both from the standpoint of tonnage and sucrose content. Both the Salt River Valley and Eastern Arizona averaged over 20 tons per acre with the highest sucrose level that had been attained since 1968.

The principal reason for the marked improvement lies in disease control. Three serious diseases crippled the yield and quality potential of the crops harvested in the summer and fall of 1970. Since effective control measures are now available for all three diseases, curly top, virus yellows, and Cercospora leaf spot, the 1970 type problems shouldn't be repeated.

Unfortunately, human nature prevents most of us from taking the necessary precautions to avoid problems as such until it is too late. An excellent example of this has been the lack of positive steps to control curly top virus in Arizona. This disease has been a serious production threat in Western United States since the early 1900's. The effectiveness of low cost systemic insecticides in minimizing losses from this disease have been demonstrated repeatedly since 1961. It is unfortunate that growers, agricultural chemical salesmen, or fieldmen have to experience or witness a disaster such as occurred in the south-western part of California's San Joaquin Valley in 1966, or in eastern Arizona in 1970, before they are convinced of the material's effectiveness. Growers using preplant applications of Thimet improved yields by an average of nine tons per acre, from 11 to 20 tons per acre. Needless to say, the value of the preplant insecticide was well accepted in 1971.

Cercospora leaf spot was the second example of the drastic, depressing influence which disease can have on yield and sucrose content. Cercospora leaf spot is a disease which only occurs under conditions of high temperature and humidity. This combination usually occurs in eastern Arizona from mid-July to early September. This disease has been combatted annually with resistant varieties and fungicides but until the recent discovery and registration of two systemic fungicides - Mertect and Benlate - control by fungicide was both ineffective and costly.

In 1970, positive improvements in sucrose concentration were achieved in small research plots and to a limited extent in some commercial fields. In 1971, a full scale treatment program was initiated both in research plots and in commercial fields. An example of the marked benefit achieved under controlled conditions in 1971 appears in Table 1.

These sugarbeets were grown under identical conditions. The only exception is that the larger beets on the left received a preplant application of phorate (Thimet) and the beets on the right did not.

It can be seen from Table 1 that both Benlate and Mertect applications resulted in significant improvements in yield and sucrose and thus in gross dollars returned. When the use of these materials is combined with careful management of nitrogen and irrigation, Cercospora leaf spot injury should be kept to a minimum. This particular program is not cheap, however, so considerable research work remains to be done to establish the practical limits of rate and treatment frequency.

TABLE 1

THE INFLUENCE OF SEVERAL FUNGICIDES ON SUGAR BEET PRODUCTION UNDER CERCOSPORA LEAF SPOT CONDITIONS

WILLCOX, ARIZONA 1971

Treatment	Rate/ Acre	Gross Sugar T/A	Root Yield T/A	Sucrose %	Pulp NO_3	Return @ $9.25 NSP
Benlate	8 oz.	5.32	38.3	13.9	1.7	553
Mertect	8 oz.	4.98	36.8	13.6	2.1	519
Benlate	4 oz.	4.72	35.0	13.5	2.2	490
Mertect	4 oz.	4.62	35.1	13.2	2.2	477
Check		3.42	30.8	11.1	3.0	367
Mean		4.74	35.8	13.2	2.1	$495

The third disease, virus yellows, is a perennial threat throughout the sugarbeet growing areas of the west. This disease has periodically threatened California production for years. Its control lies principally in the use of sanitation - that is, management of the

(Continued on page 23)

1970 Crop Honor Roll

California Districts

It is with a great deal of pleasure that we publish the names of those California sugarbeet growers whose 1970 sugarbeet crop exceeded 25 tons per acre. The 1970 crop was the best ever as evidenced by the large Honor Roll. The names are listed in descending order of pounds of sugar per acre. It is particularly interesting to note that seven growers located in the Salinas, Manteca and Mendota districts produced in excess of 15,000 lbs. of sugar per acre on a combined total of 241 acres. In terms of per capita consumption (100 lbs. per year) those 241 acres produced enough sugar to supply the annual needs of more than 32,000 people.

District I, Salinas

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
John Gardoni	70	53.72	16,580
Tony & Larry Homen	28	45.74	15,231
Los Coches Farms	16	47.53	15,040
John O. Andersen	107	46.21	14,963
Hansen Farms	47	46.29	14,905
H. & E. Christensen	21	43.70	14,893
J.J. & H. Violini	20	43.00	14,641
Michael K. Reed	26	39.95	14,518
Jim Fanoe & Son	41	42.22	14,368
Merit Packing Co.	28	46.31	14,274
Boone & Lindeleaf	49	41.98	14,271
California Coastal Farms	77	43.43	14,118
J. Oreggia & Co.	43	45.70	13,980
H. & E. Christensen	19	43.97	13,906
Corda & McDougall	42	40.45	13,831
A. Bassetti & Sons	36	40.58	13,789
Richard Morgantini	64	40.39	13,774
Arthur F. Blomquist	34	41.05	13,618
Wm. D. Crinklaw	101	41.12	13,475
Bengard & Smith	114	41.06	13,426
Freshpict Foods, Inc.	41	45.83	13,372
Wm. Whitney	40	45.48	13,335
Walter Herbert	38	44.10	13,288
Freshpict Foods, Inc.	6	40.80	13,281
W.W. Johnson & Son	68	38.21	13,245
Tondre Alarid	26	44.25	13,234
Jim Fanoe & Son	155	40.43	13,144
Bengard & Smith	15	41.80	13,114
F. J. Martin	31	43.97	13,052
Obata Bros.	45	41.56	12,859
Bennie Yamane	74	44.19	12,714
California Coastal Farms	17	39.31	12,712
E.E. & M.F. Nutting	52	37.66	12,691
Wm. Whitney	128	39.30	12,670
A. Bassetti & Sons	42	38.78	12,630
Louis Campa	31	40.00	12,625
Elmer Johnsen	104	37.89	12,534
Stephen Papina	13	41.98	12,453
Leo A. & Robert L. Meyer	42	37.89	12,424
Inter Harvest, Inc.	72	42.58	12,367
J.P.S. Abeloe & Sons, Inc.	73	38.73	12,282
Inter Harvest, Inc.	132	38.92	12,253
Bengard & Smith	42	35.87	12,242
Wm. D. Crinklaw	200	36.97	12,151
Frudden Enterprises, Inc.	9	37.22	12,019
Emil C. Meyer	119	37.67	11,973
Wm. Whitney	126	36.28	11,945
Roy Fultz	71	36.17	11,938
Jack A. Hayes	601	34.11	11,935
Wm. Whitney	60	39.03	11,871
Obata Bros.	68	38.18	11,832
D'Arrigo Bros. Co. of Calif.	43	35.40	11,826
Christensen Bros.	21	38.72	11,822
Henry Sargenti	35	36.94	11,620
Wm. D. Crinklaw	100	36.77	11,614
T. O. Tomasello Co.	46	35.94	11,486
L.C.H. Company	36	34.83	11,481
Bruce Church, Inc.	219	33.85	11,385
Merrill Farms	24	37.72	11,370
J.P.S. Abeloe & Sons, Inc.	67	38.84	11,335
California Land & Cattle Co.	44	35.45	11,315
Rianda Bros.	43	33.81	11,235
California Land & Cattle Co.	53	35.04	11,066
John Gardoni	86	34.76	11,051
Merrill Farms	73	37.62	11,044
Henry Sargenti	10	35.72	11,015
Freshpict Foods, Inc.	149	32.70	10,975
Michael K. Reed	21	33.43	10,698
California Land & Cattle Co.	75	32.78	10,629

(Continued on next page)

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Inter Harvest, Inc.	31	33.29	10,574
Bruce Church, Inc.	11	30.32	10,557
Owen T. Rice & Son, Inc.	66	33.26	10,548
Owen T. Rice & Son, Inc.	80	33.47	10,532
A. L. Clement & Son	104	32.22	10,524
California Land & Cattle Co.	95	33.51	10,513
H. & C. Overfelt	66	33.76	10,432
James H. Watson	36	30.23	10,431
J. Dale Phillips	24	32.36	10,343
Chualar Old Stage Farms	114	32.93	10,302
California Coastal Farms	61	33.83	10,301
Earl Fiscalini	61	34.58	10,215
C.C. Duncan & Son	54	35.16	10,194
Donald F. Davies	99	33.02	10,142
W.W. Johnson & Son	99	32.26	10,140
Fanoe Bros. & Sons	64	29.32	10,114
Harless Bros.	155	30.78	10,080
Earl Fiscalini	32	32.53	10,070
Fanoe Bros. & Sons	208	29.81	10,035
Yamaoka Bros.	14	37.82	10,024
Beet Sugar Development Foundation	10	30.53	10,012
D'Arrigo Bros. Co. of Calif.	57	31.14	9,939
Robert Trafton Co.	45	30.19	9,798
Kaimoto Bros.	26	33.82	9,751
John & Bob Corda, Jr.	18	34.88	9,748
Kishimura Bros.	106	29.46	9,709
Wm. Whitney	18	28.06	9,702
Jerry Scagliotti	18	27.99	9,698
B.J. Marks Family	125	29.59	9,667
Frudden Enterprises, Inc.	68	34.78	9,531
A. Bassetti & Sons	65	28.34	9,523
William Yamano	105	29.48	9,514
California Coastal Farms	92	29.02	9,473
Newhall Land & Farming Co.	75	27.58	9,291
Fanoe Bros. & Sons	86	26.71	8,992
Spreckels Sugar Co.	66	32.36	8,904
Inter Harvest, Inc.	102	25.61	8,750
Clarence Asmussen	31	26.27	8,748
Robert Heess	29	25.27	8,619
Owen T. Rice & Son, Inc.	75	28.05	8,555
Martin R. Ramseier	67	30.41	8,429
Owen T. Rice & Son, Inc.	67	28.38	8,420
William Yamano	47	26.37	8,355
Michael K. Reed	22	27.90	8,106

District II, Manteca

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
V. & R. Mettler	6	50.92	15,400
Murata Bros.	65	43.06	14,369
Joseph L. Nomellini	67	43.48	14,128
Fumio Nishida	11	49.54	13,981
Westing Farms	112	42.10	13,937
R. J. Dondero	22	41.87	13,935
Roy Nishida	22	43.13	13,793
Tanaka Farms	98	45.45	13,790
Alvarez Bros.	112	43.59	13,742
J. & R. Solari	37	43.97	13,719
Theodore R. Baskette	123	40.18	13,667
Alvarez Bros.	26	43.59	13,647
Grant & Wilson	61	39.59	13,573
Giannecchini Bros.	37	40.30	13,558
Robertson & Sons	35	38.94	13,473
Ernest F. Nunes	30	51.50	13,473
Aoyama Farms	90	40.41	13,450
Frank Giannecchini	30	41.41	13,391
Tony A. Sanchez	18	39.04	13,385
Aldo Navone	20	40.05	13,300
C.A. Nilsson	30	38.47	13,290
Fumio Nishida	7	46.18	13,216
Frank & Steve, Jr. Solari	85	39.49	13,207
Joe Toste, Jr.	40	38.71	13,199
Frank Ormonde	185	39.60	13,169
Aldo Navone	12	36.01	12,994
Westing Farms	75	37.77	12,927
Joe Toste, Jr.	78	35.19	12,865
Fumio Nishida	8	38.39	12,814
Fumio Nishida	8	48.34	12,774
Gino Pellegri	46	46.69	12,748
Robert Norman	204	37.26	12,619
Stephen Pellegri	44	35.86	12,523
C.A. Nilsson	75	36.76	12,429
Wm. F. Garden	74	36.07	12,357
Tom Hiraga	21	40.24	12,356
Dwayne Petz	26	35.72	12,339
A. Togninali	73	36.95	12,313
Manuel Amaral, Jr.	77	38.53	12,285
Wm. H. Fisk, Jr.	85	35.24	12,278
C.A. Nilsson	80	37.87	12,261
Shiba Farms	109	36.66	12,204
Merlin Miller	75	36.34	12,126
Keiji Fujinaka	127	37.99	12,100
John L. Miller	100	37.65	12,070
Henry Arata	55	37.95	12,056
Brocchini Bros.	146	37.75	11,991
San Julian Bros. & Zabalza	50	34.73	11,988
Sasaki & Mizuno	72	36.91	11,977
Tony A. Sanchez	118	36.14	11,941
Calcagno Farms	69	40.19	11,935
J. & R. Solari	57	38.23	11,928
Kaiser & Lindeman	77	38.32	11,882
Robert Batch	46	36.90	11,858
Grant & Wilson	84	36.70	11,812
Dino Flor	60	42.80	11,789
Dwayne Petz	40	33.19	11,684
David Vana	28	35.51	11,565
Robertson & Sons	90	33.83	11,533
Warren Hicks	85	38.01	11,410

(Continued on next page)

DISTRICT II, MANTECA,—continued

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Alvarez Bros.	31	32.27	11,395
Westing Farms	50	34.70	11,374
Antonio Felix	56	36.31	11,356
Stephen Pellegri	167	33.36	11,318
Calcagno Farms	98	36.90	11,268
Uyeda Bros.	17	34.32	11,259
Lucio J. Costa	52	32.46	11,153
Caminata & Podesta Co.	32	34.50	11,148
Jack Kimoto	200	33.78	11,144
John Pereira	4	37.37	11,143
R. & J. Dondero	51	35.27	11,127
Brocchini Bros.	77	34.78	11,052
Stuart R. Clever	39	33.67	11,024
John & Wm. Vignolo	93	37.01	10,973
E. Holck & Son Farms	117	31.56	10,954
Hanson & Barkley	163	31.74	10,927
Joe Toste, Jr.	40	36.30	10,922
R. & J. Dondero	106	33.68	10,864
Philip Martin, Jr.	31	36.18	10,816
Henry Arata	75	32.55	10,815
James A. Luis	96	31.68	10,780
Marshall Stiles	75	32.23	10,718
Stuart R. Clever	78	33.16	10,702
Larry Pellegri	69	34.03	10,682
Theodore R. Baskette	76	31.43	10,648
Geo. Tomura	80	31.99	10,645
Lucio J. Costa	89	29.47	10,610
Merlin Miller	75	31.89	10,600
Calcagno Farms	39	36.09	10,597
Enos & Woodward	141	30.31	10,578
Norman D. Borth	48	32.15	10,571
Calcagno Farms	34	33.06	10,569
Tanaka Farms	152	31.08	10,499
R. Albertsen	84	34.59	10,481
Russell	11	29.47	10,474
Arnaudo Bros.	73	31.35	10,467
Raymond Muller	45	34.04	10,463
Joe Toste, Jr.	70	32.79	10,437
John Carvalho	32	31.52	10,429
Tanaka Farms	189	32.27	10,278
George B. Lagorio	160	33.67	10,257
Joseph Madruga	39	31.98	10,254
Ralph Panella	75	30.35	10,252
Westing Farms	29	31.14	10,245
Larry A. Mikkelsen	30	33.15	10,241
Oliveira & Escobar	37	34.44	10,237
Arravan Farms, Inc.	29	38.55	10,234
V. & R. Mettler	20	31.90	10,212
Raymond Muller	66	32.73	10,205
Giannecchini Bros.	76	31.62	10,163
Keiji Fujinaka	21	31.79	10,138
Joseph L. Nomellini	49	31.50	10,127
George Silva	29	35.56	10,120
Lester Rodgers	78	32.42	10,111
Honda Bros.	45	31.02	10,095
Vernon Potts	42	28.83	10,077
D. R. Westbrook	127	33.73	10,043
John & Wm. Vignolo	120	31.66	10,027
Kaiser & Lindeman	245	30.17	10,014
Peter R. Ohm	65	33.42	9,970
H. Ehlers & Sons	134	32.33	9,905
Manuel L. Costa	50	27.98	9,892
Kaiser & Lindeman	87	30.05	9,889
Dino Flor	55	35.51	9,889
Manuel Silva, Jr.	82	31.85	9,873
A. Van Groningen & Sons	50	33.32	9,865
James Craven	67	32.00	9,864
George Silva	49	34.62	9,826
Thorkelson Ranches	43	34.02	9,757
R. & J. Dondero	77	30.82	9,755
Dan & Jim Pellegri	123	29.59	9,746
Irvin Muller	68	34.62	9,720
Richard A. Mettler	40	29.28	9,709
Takemori Bros.	8	29.21	9,678
James R. Nilsson	35	28.82	9,657
Raymond Owning	105	27.74	9,655
Maciel Bros.	125	27.31	9,647
Thorkelson Ranches	277	32.65	9,598
H. El Muller	63	31.40	9,542
Joe A. Silva	87	31.46	9,526
H.C. Baumgartner	13	36.02	9,524
Tony J. Pereira	50	29.14	9,510
Honda Bros.	101	29.57	9,508
Richard C. Medeiros	71	30.00	9,495
Lovegreen & Wilson	101	28.02	9,476
Collins & Towne	45	30.21	9,477
Louis Casale	269	30.39	9,464
Frank Pellegri	107	32.02	9,452
Mizuno Farms	70	32.03	9,437
Inter Harvest, Inc.	123	30.29	9,436
Manuel Amaral, Jr.	42	28.36	9,434
A. Togninali	153	28.02	9,430
Maciel Bros.	80	30.58	9,397
James A. Luis	217	27.77	9,383
Arravan Farms, Inc.	68	32.40	9,381
Kiyoi Bros.	50	31.49	9,381
Tony J. Pereira	115	27.83	9,366
John Michelena	125	33.52	9,363
V. & R. Mettler	50	27.19	9,356
Manuel Amaral, Jr.	52	32.64	9,355
E. Holck & Son Farms	30	30.87	9,348
Maciel Bros.	55	29.46	9,341
R. E. Thorsen	114	29.29	9,327
Robertson & Sons	68	31.71	9,292
Enos & Woodward	39	25.53	9,270
Robert Batch	88	28.61	9,260
Shiba Farms	38	29.72	9,256
H. Ehlers & Sons	72	32.49	9,248
Sakakura Farms	40	29.55	9,206
R. E. Thorsen	38	28.74	9,205
Arnaudo Bros., Inc.	14	32.10	9,184
Damon Pombo	162	28.85	9,099
Arravan Farms, Inc.	118	33.36	9,099
Jacobsen & Sons	96	32.27	9,084
Lovegreen & Wilson	125	26.27	9,074
Calcagno Farms	49	29.21	9,045
Robert Batch	71	28.21	9,040
Vernon Potts	31	28.73	9,029
Alan Giovannoni	129	27.70	9,027
Dwayne Petz	163	26.94	8,990
Jim Nishida	23	29.40	8,968
Glenn Faust	37	35.43	8,958
Takemori Bros.	100	26.69	8,840
Melvin S. Silveira & Son	80	27.19	8,780
G. C. Johnson & Sons	129	30.15	8,779
Phillip Martin, Jr.	213	27.83	8,709
Ishida Bros.	105	30.30	8,659
Philip Martin, Jr.	53	30.74	8,658
Jack T. Hori	128	26.39	8,623
Albert Fonseca	170	25.41	8,595
Dan & Jim Pellegri	35	25.95	8,555
Fred F. Fukano	121	27.48	8,532
Joe Ratto, Jr.	49	27.42	8,532

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Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
John A. Roseberry	162	28.18	8,523
Joseph Madruga	53	26.23	8,457
Thorkelson Ranches	108	29.16	8,454
John Carvalho	25	26.76	8,451
Frank Fialho	94	31.34	8,408
Tokuyoshi Bros.	43	26.66	8,383
Maciel Bros.	77	26.95	8,363
Joseph Madruga	34	25.87	8,354
Murata Bros.	106	26.28	8,343
Morey Egusa	57	25.03	8,324
Sakakura Farms	37	25.37	8,301
Shiba Farms	100	25.14	8,298
Herman & Ronald Ohm	240	25.73	8,287
Cerutti Bros.	136	33.07	8,276
Joe Gambini	35	30.68	8,242
Sakakura Farms	182	26.12	8,214
Takemori Bros.	30	26.37	8,129
Ronald Nunn	58	27.68	8,058
Takemori Bros.	54	25.09	8,046
Frank Fialho	103	28.13	8,001
Paga Ranch	72	25.98	7,983
H. C. Baumgartner	4	31.10	7,970
Guido Biagi	120	25.55	7,939
Raymond Muller	72	26.18	7,788
Interstake Farms	225	27.56	7,770
Renuel Carlson	49	25.27	7,705
Irvin Muller	81	27.45	7,687
A. P. Mikkelsen	33	25.27	7,549
R. E. Thorsen	41	25.27	7,430
Ronald Nunn	10	26.54	7,319
Ishida Bros.	77	26.82	7,302
James Craven	91	28.89	7,279
Sano Bros.	67	28.70	7,246
James Craven	36	26.90	7,173
George Biagi	106	25.68	7,556
Lester Rodgers	52	25.13	5,911

District III, Woodland

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Jimmy Leong	77	39.87	13,501
Lloyd M. Eveland	116	42.11	13,136
Arnold Collier	52	39.83	12,896
Wm. A. McDonald	66	36.65	12,763
Holdener & Wiegand	132	36.50	12,639
Lloyd M. Eveland	34	37.85	12,524
Anderson Brothers	72	36.76	12,366
Harley Rominger	37	36.64	12,238
Richard H. Raycraft	131	35.90	12,012
W.M. Duncan	87	33.95	12,000
Heidrick Farms, Inc.	199	36.01	11,932
Emmett Heidrick	43	36.29	11,929
Bulkley Ranch	136	34.24	11,905
Val Galindo	13	35.82	11,708
Bulkley Ranch	56	34.72	11,695
E. M. Ullrich	38	33.88	11,669
Emmett Heidrick	62	35.02	11,633
Solano Farms, Inc.	67	33.46	11,609
Robert G. Stephens	49	39.05	11,566
Wetzel Bros.	23	35.07	11,548
John M. Lear	123	34.49	11,447
Holdener & Wiegand	74	32.48	11,423
Lloyd M. Eveland	132	32.88	11,407
Pete Fortis	81	34.40	11,398
Edward R. Bianchi	40	33.71	11,341
Hatanaka Bros.	336	35.00	11,289
K. Matsumoto & Sons	56	33.20	11,287
Holdener & Wiegand	57	31.60	11,206
K. Matsumoto & Sons	62	32.98	11,126
Heidrick Farms, Inc.	280	34.03	11,098
Winston R. Peterson	67	33.86	11,083
Marino Romani	92	31.18	11,071
Wetzel Bros.	28	32.69	11,059
Fred Rehrman & Son	240	32.79	11,054
Val Galindo	24	33.99	11,031
Schroeder Brothers	99	32.31	11,027
Ernest Dietrich	20	33.24	10,987
Vernon A. Mast & Sons	202	32.46	10,976
G.A. Hanks & Sons	154	33.55	10,965
Heidrick Farms, Inc.	202	31.45	10,892
G.A. Hanks & Sons	99	31.21	10,832
Harley Rominger	34	35.33	10,814
Rudy Howald	128	33.98	10,783
E.L. Wallace	214	34.16	10,760
George W. Anderson	48	32.79	10,730
Frates & Shimada	203	34.65	10,721
E. M. Ullrich	74	31.28	10,721
H.A. Petersen	51	32.62	10,717
Rodolfo Lozano	33	31.36	10,712
Oji & Pires Farming Co.	98	31.78	10,707
Alan Borchard	28	35.02	10,682
John M. Lear	74	30.97	10,669
Eugene G. Cain	52	31.62	10,654
Robert G. Stephens	92	32.04	10,643
Emmett Heidrick	116	33.11	10,634
Robert G. Stephens	24	32.71	10,616
Val Galindo	120	32.27	10,593
R. G. Arens	45	38.50	10,564
John Lamont	149	31.81	10,556
Antonio D. Fortes	88	31.02	10,531
Oji Bros. Farm, Inc.	25	32.03	10,475
J.R. Phillips	63	31.42	10,470
Meek & LeMaitre	68	33.64	10,458
R. G. Arens	95	30.96	10,427
Takeuchi Bros.	77	29.14	10,359
Giannoni Brothers	179	31.53	10,357
Rodolfo Lozano	109	30.89	10,342
Ernest Dietrich	28	31.69	10,324
Joe Gnoss, Jr.	168	30.37	10,296
Bulkley Ranch	56	30.42	10,265

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Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Arlan Moore	72	34.69	10,255
Anderson Brothers	48	33.44	10,253
Ernest Weyand	19	30.51	10,236
Martinelli Bros.	19	32.47	10,221
Alvernaz Farms, Inc.	16	34.54	10,189
Alfred W. Cruichshank, Jr.	68	35.64	10,170
Joe Lopes, Jr.	66	32.19	10,168
F. & F. Stephens	150	28.94	10,121
Edgar Everett & Son Farms	135	27.89	10,106
Pete Aspiras	42	30.30	10,086
Perry Farms	76	33.04	10,084
Durst Bros.	74	30.21	10,082
Manuel Bastiao	119	33.78	10,070
Heidrick Farms	199	30.09	10,069
Lloyd M. Eveland	140	30.76	10,058
Richard Moore	61	31.93	10,044
Robert G. Stephens	50	32.89	10,038
Lloyd M. Eveland	70	29.01	10,012
Wm. L. Davey & Sons	57	28.19	10,002
Martinelli Bros.	93	33.63	9,996
Wm. L. Davey & Sons	37	29.75	9,923
L.C. Ulrich	244	29.23	9,889
C.M. Ordonez	38	29.86	9,886
Joe Gnoss, Jr.	71	29.73	9,885
Don Mumma	16	29.69	9,860
Meek & LeMaitre	101	31.62	9,806
Nelson & Mata	33	31.29	9,789
Don Mumma	18	28.89	9,789
E.L. Wallace	141	28.76	9,786
Solano Farms Inc.	108	29.00	9,783
Robert Leslie Button	169	31.68	9,779
Charles Schaupp & Son	146	27.70	9,767
Oji Bros. Farm Inc.	27	28.01	9,765
Jimmy Leong	70	31.15	9,746
Jones Bros.	249	30.25	9,730
Roth Bros.	72	29.33	9,716
Roth Bros.	62	29.32	9,710
Holdener & Wiegand	135	27.37	9,673
Meek & LeMaitre	86	30.26	9,672
H. A. Petersen	88	29.84	9,667
H. A. Petersen	100	28.48	9,647
Meek & LeMaitre Inc.	70	29.88	9,646
Lloyd M. Eveland	60	28.76	9,620
Pete Fortis	74	27.47	9,606
Lloyd M. Eveland	101	29.60	9,593
M. Martinez	35	28.30	9,588
Plank & Maupin	43	29.35	9,578
James A. Walker & Sons	74	31.64	9,520
Alvernaz Farms, Inc.	38	32.00	9,509
Val Galindo	42	29.80	9,509
Manuel Bastiao	36	29.89	9,485
Wallace Bros.	152	28.14	9,477
James Campbell	88	28.86	9,437
R. G. Arens	44	26.47	9,413
Schneider Fricke Schneider	183	28.96	9,401
Alvernaz Farms Inc.	89	32.33	9,355
E.L. Wallace & Sons	167	31.05	9,345
Joe Lopes, Jr.	197	29.07	9,316
Plank & Maupin	52	26.91	9,274
Ernest Dietrich	56	28.54	9,270
Paul Torres	37	28.49	9,255
Val Galindo	75	26.24	9,197
E.N. Winters	50	28.12	9,186
D.L. & Robert L. Hayes	73	27.07	9,185
Anderson Brothers	74	28.44	9,184
Eugene C. Cain	18	31.39	9,133
C.M. Ordonez	122	27.71	9,131
Solano Farms Inc.	71	26.02	9,099
Yoloma Farms	144	27.62	9,079
Hatanaka Bros.	98	28.73	9,069
Oji Bros. Farm Inc.	126	32.43	9,060
Wayne Hine	95	27.04	9,058
Charter Farms	75	28.46	9,051
Anderson Brothers	54	28.11	9,037
H.A. Petersen	52	28.29	9,010
G.A. Hanks & Sons	220	28.57	8,987
George L. Soares	88	29.79	8,982
Solano Farms Inc.	72	26.51	8,982
Heidrick Farms, Inc.	165	27.85	8,972
L.C. Ulrich	132	26.06	8,969
Heidrick Farms, Inc.	273	25.47	8,933
Lloyd M. Eveland	46	26.22	8,915
Perry Farms	16	28.04	8,900
R. G. Arens	71	31.81	8,896
Nelson & Mata	145	25.57	8,869
Alonzo Bros.	138	26.35	8,856
Arlan Moore	41	28.47	8,837
Plank & Maupin	150	25.79	8,816
Joe Gnoss, Jr.	99	25.59	8,811
William H. Jones	56	28.18	8,804
K. Matsumoto & Sons	49	29.31	8,789
Plank & Maupin	38	30.18	8,787
Roth Bros.	53	29.05	8,774
James A. Walker & Sons	100	27.08	8,760
Alvernaz Farms Inc.	50	27.45	8,734
Lloyd M. Eveland	155	25.23	8,729
Orth Bros.	40	26.62	8,728
Meek & LeMaitre	97	27.22	8,707
Nishikawa Brothers	156	26.67	8,687
Rominger Bros.	118	26.59	8,685
Roth Bros.	63	26.50	8,671
Alvernaz Farms Inc.	24	28.17	8,666
Oji Bros. Farm Inc.	229	26.97	8,661
Rudy Howald	95	26.13	8,659
Schneider Fricke Schneider	102	26.90	8,642
Paul Stephens & Son	138	27.12	8,630
Joe Gnoss, Jr.	135	25.79	8,622
Nishikawa Brothers	148	26.48	8,617
Nelson & Mata	17	26.22	8,577
G.A. Hanks & Sons	37	27.51	8,545
Roth Bros.	37	28.62	8,529
Val Galindo	38	27.07	8,508
Heidrick Farms, Inc.	165	25.35	8,507
Meek & LeMaitre	42	29.33	8,503
Vernon A. Mast & Sons	200	25.89	8,466
Alvernaz Farms, Inc.	16	29.26	8,457
Ellendale Farms, Inc.	86	27.31	8,447
John Beeler Jones	70	26.19	8,415
G.A. Hanks & Sons	163	25.54	8,375
Dan W. Howard	86	26.70	8,368
Oji & Pires Farming Co.	160	25.93	8,361
Timothy & Blickle	23	27.29	8,324
Oscar Durst Sr. & Jr.	121	25.72	8,315
Myers & Reynolds	72	26.99	8,311
La Grande Farms	51	25.20	8,303
Howard Bros.	123	25.39	8,272
Vernon A. Mast & Sons	38	26.84	8,192
Joe Lopes, Jr.	159	25.37	8,162

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Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
H.L. Fredericks, Jr.	54	28.15	8,137
Orth Bros.	52	25.54	8,115
Sagara Bros.	61	27.18	8,088
Alvernaz Farms, Inc.	9	26.07	8,012
Richard Martinez	75	29.69	8,006
Wallace Bros. Ranches	67	25.40	7,789
Schneider Fricke Schneider	16	25.64	7,759
Holdener & Wiegand	136	25.34	7,722
Durst Bros.	72	26.61	7,657
Heidrick Farms, Inc.	240	25.47	7,639
Schneider Fricke Schneider	38	25.00	7,532
Harry Giminez	62	25.57	7,528
Robert C. Gill	72	25.44	7,476
Sagara Bros.	76	25.20	7,472
Alvernaz Farms, Inc.	38	25.25	7,427
Schoeningh Farms	106	26.26	7,394
Desert Farms of California	212	25.17	7,214
Catherine Strehle & Sons	70	25.53	7,094
Clark Davis	27	25.20	6,827
Bernie Gorman Jr.	154	25.05	6,735
G.A. Hanks & Sons	141	26.57	6,201

District IV, Mendota

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Marchini Bros.	20	49.16	15,725
Sorg Bros.	63	47.09	15,557
Marchini Bros.	26	47.72	15,430
Eugene Nord	12	51.11	15,177
Marvin Wooten	60	42.73	14,621
Sherman Cave	9	48.26	14,008
Dutra Bros.	29	48.12	12,921
A. Lobue Farms	139	43.04	12,874
Marion F. Harris	75	46.03	12,852
Willmer Hedman	42	40.15	12,836
George Andrews	166	42.85	12,683
Vernon Porter	134	38.39	12,494
Newhall Land and Farming Co.	29	41.36	12,442
Joseph P. Maiorino	85	35.67	12,434
Martin E. Mason	72	42.91	12,100
William Fahey	149	35.11	12,085
Kenneth B. Siebert Farms	122	41.69	12,081
Wayne Sniffin & Desert Ranch	85	36.20	12,054
Giffen Inc.	254	44.38	12,049
Mitchellinda Ranches, Inc.	20	43.78	11,956
Wayne Sniffin & Desert Ranch	62	39.75	11,890
Santa Rita Ranch	328	34.85	11,847
Hammonds Ranch	128	34.88	11,702
Vernon Porter	50	33.42	11,654
Timco-Turner Island	676	34.42	11,634
Keith Erskine	338	33.31	11,339
Del Testa Farms	37	35.96	11,256
Martin Costales	58	35.88	11,205
Joe G. Machado, Jr.	30	32.67	11,133
D.T. Locke Ranch, Inc.	46	35.70	11,081
Giffen, Inc.	177	36.73	11,049
Triple M Cattle Co.	213	33.12	10,991
O'Banion Ranches	52	33.46	10,989
Floyd Williams	96	37.48	10,948
Russell Terry	11	42.29	10,930
Motte Ranches, Inc.	48	36.59	10,925
Kenneth Peelman	36	37.47	10,847
Robert Cardwell	46	34.91	10,845
Wolfsen Land & Cattle Co.	756	32.52	10,790
Des Jardins Bros.	91	29.77	10,767
Sorg Bros.	37	32.57	10,707
Melvin Hughes	57	34.95	10,643
Don Sorg	33	30.82	10,634
Harold O'Banion	21	33.12	10,591
Green Acre Farms	97	33.62	10,554
C.E. & R.B. Klepper	177	37.64	10,529
Sam & D.M. Biancucci	84	35.48	10,523
Charles Wolsey	37	37.49	10,444
Robert Cardwell	57	33.05	10,420
Irwin R. Efird	97	37.04	10,407
Coalinga School Farms	5	33.92	10,350
Giffen, Inc.	195	35.54	10,280
Newhall Land & Farming Co.	88	33.41	10,278
William Des Jardins	141	27.70	10,245
S-K Ranch	34	38.39	10,245
Sam & D.M. Biancucci	102	35.90	10,233
Eugene Nord	23	34.52	10,193
Markarian Farms	38	33.86	10,152
W.B. Camp & Sons	114	34.79	10,148
Rancho Trio	84	34.80	10,143
John D. Costa	56	40.82	10,122
John D. Costa	51	32.79	10,115
John D. Costa	33	34.10	10,100
Sam & D.M. Biancucci	31	36.80	10,073
Newhall Land & Farming Co.	44	34.63	10,065
Giffen, Inc.	273	36.35	10,062
Herman & O.L. Walls	63	34.13	10,051
Harold O'Banion	132	29.97	10,009
Newhall Land & Farming Co.	44	36.56	9,995

(Continued on next page)

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Delmer Mettler	35	36.02	9,979
W.B. Camp & Sons	77	35.26	9,976
Sunshine Farms	38	36.80	9,908
Albert J. Catrina	53	28.72	9,895
Pucheu Bros.	61	31.24	9,892
Del Testa Farms	28	30.40	9,859
Gilkey Farms, Inc.	220	29.73	9,850
W. L. Simmons	68	38.90	9,808
Paul W. Demkey	42	38.41	9,787
Harold O'Banion	46	31.32	9,780
Marchini Bros.	35	31.36	9,767
Robert Cardwell	61	32.14	9,749
Joe G. Fanucchi & Sons	58	36.19	9,743
Bonanza Farms	74	31.15	9,742
Houchin Bros. Farming Co. Inc.	97	33.97	9,703
Markarian Farms	72	30.20	9,701
Giffen, Inc.	140	37.06	9,676
S. E. Brown	39	37.51	9,645
Locke Bros.	55	34.25	9,635
Crettol Farms	39	38.50	9,597
Green Acre Farms	59	30.90	9,582
Crettol Farms	34	38.87	9,544
Carl Sumpter	24	25.78	9,539
Hansen-Fortune	70	30.14	9,526
Giffen, Inc.	376	34.82	9,509
Eckhardt Tripple	34	31.06	9,506
Bruno Cauzza	39	39.74	9,502
Newhall Land & Farming Co.	79	32.18	9,490
William E. Glotz	69	30.13	9,441
Russell Terry	41	35.08	9,369
Ted J. Gromala	13	31.14	9,352
Southlake Farms, Burrel	74	30.84	9,350
Wayne Sniffin & Desert Ranch	95	28.71	9,337
Sherman Cave	17	32.68	9,314
Sam & D.M. Biancucci	73	30.89	9,309
Hugh S. Jewett	49	32.73	9,299
Hugh S. Jewett	44	32.57	9,293
R. H. Garlow Farms	68	32.65	9,281
W.B. Camp & Sons	77	30.19	9,262
Jack Jones	29	27.62	9,213
Rainbow Ranch, Inc.	112	31.07	9,194
Sam & D.M. Biancucci	72	32.33	9,164
Louis A. Clarot	32	36.11	9,160
Borges Farms	30	32.97	9,151
E. L. Goodspeed	172	30.00	9,149
Frank E. Heuer	40	30.76	9,147
John D. Mederos	38	32.73	9,134
Jimmie Icardo	71	32.64	9,126
Mitchellinda Ranches, Inc.	20	33.38	9,123
Bonanza Farms	73	31.13	9,109
Clayton Brown	73	32.06	9,102
Timco, Murrieta Farms Div.	145	31.09	9,065
R.H. Garlow Farms	50	29.89	9,059
Clarklind Farms	54	33.18	9,056
Bonanza Farms	77	28.37	9,047
Henson & Landers	73	32.47	9,033
Robert Yearout	24	32.20	9,026
Hammonds Ranch	150	28.75	9,023
Gragnani Bros.	80	32.02	9,010
Richard Stuhaan	43	36.53	9,010
University of Ca. Board of Regents	2	29.63	8,977
Noble Land & Cattle Co.	77	28.79	8,964
Milo Jacobsen	186	31.23	8,952
Ralph Forrest	74	27.85	8,950
Carl Sumpter	47	25.05	8,933
Ralph Forrest	60	34.31	8,931
Killdeer Farms	68	30.72	8,923
Kern County Land Co.	193	34.76	8,917
Robert Cardwell	77	30.19	8,909
Roy Henson & Sons	80	31.40	8,909
Lone Palm Farms	34	29.44	8,907
Pucheu Ranch	36	29.02	8,905
Rio Vista Farming Co.	142	34.56	8,901
Russell Terry	10	33.70	8,887
Joe G. Machado, Jr.	69	25.79	8,885
Newhall Land & Farming Co.	131	27.92	8,880
Paul J. Crevolin	64	27.84	8,869
John T. Laningham	48	30.62	8,851
Frank Orff	60	27.77	8,847
Barling Bros.	90	32.27	8,830
S & S Ranches	72	32.79	8,821
John Cauzza	132	30.33	8,803
Giffen, Inc.	294	30.80	8,802
C.F. Andresen, Jr.	30	28.72	8,794
A. H. Wegis & Sons	148	28.73	8,756
Giffen, Inc.	238	30.46	8,744
Giffen, Inc.	241	30.82	8,688
W. M. & D. L. Colson	76	32.06	8,648
Fredlo Farms	83	38.18	8,646
D. T. Locke Ranch, Inc.	149	27.56	8,631
Little & Hanes	35	29.76	8,617
Stanley Hefner	18	33.11	8,555
Uchita Bros.	60	31.09	8,517
Robert Teicheira	73	28.69	8,515
Kern County Land Co.	152	31.28	8,479
Vignolo Farms	87	27.93	8,451
J. Howard Porter	53	33.66	8,438
Roy Henson & Sons	55	29.71	8,426
Guthrie Farming Co.	38	36.22	8,418
Wayne Sniffin & Desert Ranch	80	27.75	8,415
Palm Farms Inc.	147	29.96	8,402
Bonanza Farms	82	27.70	8,401
Barlow Farms	33	29.51	8,400
Kern County Land Co.	126	30.63	8,396
Sanders & Sanders	103	33.27	8,396
Dillon Bros.	230	33.31	8,393
Dillon Bros.	146	31.43	8,392
Manuel Bettencourt	10	30.06	8,373
Kenneth McClanahan & Sons	39	33.75	8,373
Double "L" Farms	46	30.19	8,308
Southlake Farms, Burrel	111	28.74	8.275
F. R. Miller	100	28.56	8,270
Gragnani Bros.	153	26.36	8,269
Roy Henson & Sons	68	30.75	8,250
Giffen, Inc.	292	32.56	8,247
August Jr. and Richard E. Metzler	57	27.42	8,232
Kern County Land Co.	29	31.00	8,226
Alfred Palla	118	29.64	8,220
W.R. Greenlee Farming	69	33.40	8,216
Killdeer Farms	92	30.75	8,203
Louis Ricci	35	25.42	8,201
Richard D. Hohlbauch	58	30.48	8,187
Harold Bontrager	19	28.72	8,182
R. E. Shick	35	32.49	8,181

(Continued on next page)

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Stuhaan Farms	29	31.27	8,180
Tollie Barton & Sons	35	28.70	8,157
Bob Cauzza	117	26.47	8,154
Martin Costales	36	25.64	8,149
Markarian Farms	37	26.59	8,134
K & P Farms, Inc.	53	29.54	8,116
Newhall Land & Farming Co.	80	27.35	8,100
Newhall Land & Farming Co.	36	29.78	8,099
Carl Gunlund	75	25.78	8,083
Joe Freitas, Jr.	38	30.52	8,032
Newhall Land & Farming Co.	56	27.28	8,025
Jim Giovannetti Farms	71	28.78	8,024
Sherman Cave	24	26.18	8,007
Giffen, Inc.	161	30.86	8,005
Tracy Ranch Inc.	82	26.63	8,001
Bob Cauzza	62	29.31	7,996
Jessup Farms	118	35.51	7,992
Aladdin Ranch	149	28.09	7,972
R.H. Garlow Farms	22	26.54	7,970
Goodman Traction Ranch	77	26.27	7,970
Barnard Bros.	42	26.95	7,968
Tracy Ranch Inc.	50	30.05	7,962
F.W. Handel Farming	194	27.30	7,962
Marion Harris	261	28.67	7,953
Ernest E. Sullivan	68	28.34	7,907
Fisher Bros.	62	29.13	7,884
Pilibos Bros.	85	31.51	7,872
Mitchellinda Ranches, Inc.	10	29.76	7,870
Robert Cardwell	74	25.42	7,866
Bonanza Farms	75	25.50	7,841
Sanders & Sanders	134	27.55	7,829
Tracy Ranch Inc.	30	26.78	7,818
Jim Frick Ranches	80	30.82	7,813
Ritchey Bros.	85	30.57	7,806
Tom and Henry Naito	55	26.22	7,805
Rex Ballengee	166	28.61	7,794
Joe G. Fanucchi & Sons	69	29.61	7,783
Torigiani Farms	101	25.43	7,780
Cerro Bros.	77	31.71	7,777
J. Howard Porter	32	30.77	7,756
M & I Farms	75	27.86	7,700
Harold Bontrager	57	26.77	7,697
M & I Farms	49	31.36	7,676
Bonanza Farms	73	25.16	7,671
Parsons Ranch	55	31.12	7,670
Palm Farms Inc.	261	28.39	7,645
Stanley Hefner	8	30.32	7,633
Marcus Noel	25	28.46	7,619
J.C. & H.H. Lewis	44	28.85	7,619
W.B. Camp & Son	81	30.64	7,618
Ernest E. Sullivan	30	26.61	7,617
Clariklind Farms	29	29.99	7,613
Johnson & Johnson	38	31.92	7,610
Goose Lake Farms	53	26.73	7,583
Ferdinand Palla	59	27.88	7,575
George Bassett, Jr.	129	27.69	7,556
Clayton Brown	69	26.65	7,545
Jake Kroeker Sons	75	28.40	7,539
R.W. Renner	151	27.20	7,525
J.C. & H.H. Lewis	18	27.59	7,512
Dale Snell	36	26.08	7,511
Jacob Ryser	85	27.55	7,452
M & I Farms	60	25.00	7,445
Green Acre Farms	36	25.53	7,444
Schramm Ranches, Inc.	195	29.17	7,437
Rio Vista Farming Co.	67	28.70	7,432
Kern County Land Co.	206	26.89	7,419
R.E. Shick	38	29.00	7,376
Ed Nagel	60	26.46	7,368
H & H Farms, Inc.	77	27.69	7,350
Tony V. Cardoza & Son	103	29.37	7,329
Gragnani Bros.	77	25.04	7,305
Ernest E. Sullivan	148	25.10	7,285
Double "L" Farms	185	25.80	7,274
Jake Kroeker Sons	41	29.25	7,250
Killdeer Farms	155	28.03	7,240
Belluomini Bros.	149	25.22	7,237
Kern County Land Co.	158	30.13	7,215
James V. Pryse	55	26.48	7,204
Houchin Bros. Farming Co. Inc.	116	27.67	7,202
Palm Farms Inc.	60	26.51	7,200
Martin & Mason Snow	85	25.75	7,160
Gragnani Bros.	143	27.04	7,134
H & H Farms, Inc.	48	29.00	7,115
Wallace Reimer	21	28.72	7,098
Kern County Land Co.	37	25.78	7,073
Stuhaan Farms	113	27.31	7,053
Wedel Farms	195	25.87	7,040
Vignolo Farms	220	27.27	7,017
H. & H. Farms, Inc.	73	30.62	6,952
Jesse Dennis	58	27.68	6,943
Fanucchi Bros.	52	26.50	6,924
M & I Farms	90	26.41	6,885
Chase & Harmon Farms	68	30.55	6,883
Sunset Ranch	265	28.46	6,825
Rio Vista Farming Co.	276	25.86	6,787
Richard Rogers	14	28.26	6,763
Pomeroy & Jewett	116	26.80	6,646
Nichols Farms, Inc.	130	26.43	6,646
Double "L" Farms	69	27.13	6,639
Chase & Harmon Farms	81	28.87	6,626
Houchin Bros. Farming Co. Inc.	159	28.02	6,624
Houchin Bros. Farming Co. Inc.	63	29.88	6,624
Milham Farms Inc.	90	25.81	6,596
Ralph Forrest	55	25.77	6,507
Russell Terry	11	26.20	6,480
Maple Ranch	26	25.36	6,351
Tracy Ranch Inc.	74	25.44	6,336
C.E. Luker	42	28.13	6,324
McKittrick Ranch, Inc.	143	25.87	6,112
H & H Farms, Inc.	39	27.54	6,031

Facts You Should Know About Sugar And Health

The following article was prepared by Sugar Information, Inc. of New York and answers 14 of the most frequently asked questions on sugar and health. Sources used in this factual article will be supplied upon request.

Are we Americans eating much more sugar today than we used to?

According to U.S. Department of Agriculture records, our sugar consumption today is almost exactly the same as it was 46 years ago. Per capita consumption from 1925 to 1929 averaged 102.4 pounds a year; per capita consumption in 1970 was 102.5 pounds. Except for the period when sugar was rationed because of World War II, our sugar intake has generally ranged between 97 and 101 pounds a year since 1931. Because of the rising American standard of living during the past century, yearly sugar consumption moved up to 65 pounds per person by 1900, increasing every year until 1924, when a plateau was reached.

Aren't Americans the biggest sugar consumers in the world?

A number of countries eat far more sugar per person than we do here in the United States. Several of these countries are among the healthiest in the world. Following are reported per capita sugar consumption figures for leading sugar consumers in 1970, based on private and governmental estimates of consumption and UN reports on population trends:

Ireland	126 pounds
Netherlands	122
Australia	115
United Kingdom	111
New Zealand	110
Denmark	106
Israel	105
Switzerland	104
U.S.A.	102
Canada	102
Costa Rica	95
Singapore	95
Norway	94
Cuba	94

Do we eat too much sugar?

There is no commonly accepted, scientific guide to what constitutes "too much" of most foods. Nutritionists generally agree that the Recommended Dietary Allowances published under the auspices of the Food and Nutrition Board of the National Academy of Sciences is a dependable guide to the nutrients needed daily to maintain health. This publication (revised 1968) sets a daily requirement of 2800 total calories for men between ages 22 and 35, and 2000 calories for women in the same age group.

Although the portion of the calories assigned to carbohydrates is not stated, many nutritionists agree that some 50 per cent of the daily calorie intake should be carbohydrates. About 1400 calories a day for a young adult man, therefore, would be in the form of sugar or starch. The Recommended Dietary Allowances points out that during the last 60 years consumption of sugars and syrups has increased 25 per cent. It also states that "there is insufficient evidence to indicate that the quantity of simple sugars consumed by most Americans has an adverse effect on their serum lipids." For this reason, the document adds, "changes in the type of carbohydrates in the diet would not be warranted."

Average daily per capita consumption of sugar in the United States is slightly under 4½ ounces, or less than 500 calories. This would hardly be described as "too much sugar" except in the case of very low-calorie diets. Nutritionally, there are no specific requirements established for carbohydrates as to type, source, or amount.

Wouldn't we be better off eating raw sugar instead of refined white sugar?

When people talk about "raw sugar," they are usually referring to cane sugar after its initial processing in a sugar mill, or to a stage in beet sugar after it has been clarified from diffusion juice but before it is fully refined. Raw sugar is about 96% pure carbohydrate, with such extraneous material as bits of soil, yeast, molds, waxes, bacteria, lint and beet pulp or cane fibers. It also contains moisture, mineral salts and organic non-sugars. The proportions of these vary depending on the source of the original sugarcane or sugar beet. At this stage, it must be noted, raw sugar is not considered under Food and Drug regulations as suitable for direct home consumption.

What advantages does raw sugar offer over refined sugar? It is sometimes suggested that raw sugar contains minerals and vitamins lacking in the refined product. This claim merits examination.

Minerals: Raw sugar contains less than one-half of one per cent (0.49%) of minerals-containing ash. Of this, calcium, potassium, magnesium, silicon and phosphorus are found in limited amounts. Still smaller amounts of iron, sodium, manganese, aluminum and

(Continued on next page)

other metals can be detected. There is more iron in three slices of calf's liver, and more calcium in a serving of oyster stew, than in a pound of raw sugar.

Vitamins: A study by two Yale scientists, working under a grant in aid provided by the Sugar Research Foundation concluded that raw sugars and other sugar products contain vitamins in such small quantities "as to be completely impractical as a nutritional source." The thiamine in raw sugar, they found, is "reduced to the vanishing point." Eating a full pound of raw sugar a day would provide about 10 per cent of the recommended allowances of riboflavin and niacin (in the B-complex group of vitamins). It should be noted that two scrambled eggs offer 30 per cent of the daily riboflavin requirement, and a serving of broiled halibut contributes more than half of the niacin allowance.

Raw sugar hardly seems the answer to our need for these nutrients. There is no good reason why sugar should be required to supply minerals, vitamins or proteins in addition to calories — any more than eggs should be criticized for not supplying Vitamin C, or orange juice for being deficient in fat. Diets that include a proper variety of foods contain all necessary vitamins and minerals. If diets do not include these nutrients, the small amounts provided by raw sugar cannot be of much help.

Is sugar a factor in causing coronary heart disease?

It has been claimed that high sugar consumption makes an important contribution to heart disease. This can hardly be supported on the available evidence.

a) Proponents of this hypothesis point out that the incidence of heart disease has risen during the period that consumption of sugar has increased. If rates of coronary heart disease go up when sugar consumption rises, then heart disease should be expected to level off when sugar intake stays put. In fact, however, while sugar intake per capita in the United States has hardly varied from year to year since 1925, the death rate from coronary heart disease has steadily increased.

b) As epidemiological evidence, it is claimed that countries with high sugar consumption have higher death rates from coronary heart disease than countries with lower sugar levels. A study of 33 countries, published in 1970, shows that such a relationship is dubious. In Sweden and Finland, for example — two neighboring countries — sugar consumption is almost identical. Yet the death rate from coronary heart disease for males in Finland is 56 per cent higher than in Sweden. Sugar consumption per person in the United Kingdom averages 16 per cent higher than in the United States, but deaths of men from coronary heart disease is 20 per cent lower. Similar comparisons may be made for two neighboring South American countries: Columbia and Venezuela. Columbia's per capita sugar consumption, according to United Nations statistics, is 16 per cent higher than Venezuela's; its male mortality rate from coronary heart disease is only 20 per cent of its neighbor's. It is difficult to accept the assertion that the intake of sugar is "the basic component of nutrition leading to atherogenesis."

c) A third form of evidence that has been offered to show a link between sugar consumption and heart disease is a study of the sugar-eating habits of men who had suffered myocardial infarction — a type of heart attack. Through a questionnaire filled out by patients and a control group, it was determined that the men who had had the heart attack ate more sugar than the healthy men. The number of men studied was fewer than 100. A similar questionnaire, given to more than 1,300 men, did not reveal any correlation between their sugar-eating habits and heart disease or even between sugar intake and weight gain after the age of 25. Still another study sponsored by the British Medical Research Council in four medical centers found no basis for the claimed sugar-heart disease link. Its conclusion: ". . . the evidence . . . is extremely slender."

Few specialists in heart disease or nutrition have shown support for this contention. Evidence has been scanty, and what there is has been disputed or contradicted.

Does sugar contribute to heart disease by causing a rise in the fat content of the blood?

Serious concern has been shown about the relation between coronary heart disease and the levels of blood lipids, or fats. Higher blood fats, it is suggested, result in an increase in the risk of heart disease. Most attention has been paid to one type of fat in the blood — cholesterol. It has also been claimed that diets high in sugar produce an increase in another type of blood lipids — triglycerides.

Studies of the importance of sugar in producing triglycerides have been analyzed and reviewed by researchers. One group of investigators found that a high-sugar diet increases the amount of triglycerides in the serum only when the diet also includes a high proportion of saturated fats. Other investigators have found that when smaller, but still high proportions of sugar are in the diet, the sugar has no more effect on triglyceride production than other carbohydrates. The U.S. diet has a lower carbohydrate content (and higher fat content) than most other countries. It cannot be claimed that an over-consumption of carbohydrates is a major factor in lifting blood fat levels.

A Harvard review of the literature on the effect of nutrition on coronary heart disease emphasizes that when "dietary simple sugars" like sucrose are replaced by complex carbohydrates like starches, the reduction in blood lipids are of such a small order that "they have no practical importance." It also points out that populations habitually consuming diets low

in fat and high in carbohydrates have low levels of all blood lipids, including triglycerides.

Here again, the part played by sugar as a cause of heart disease is highly questionable.

Does sugar cause diabetes?

Diabetes mellitus is a disorder of the body's metabolism. When a normal person eats carbohydrates — sugars and starches — they are converted into glucose, a simple sugar, which is absorbed into the bloodstream and is used by the body for energy. The diabetic person cannot utilize glucose efficiently. As a result, his blood has a higher-than-normal amount of glucose, and glucose is often present in the urine. It is common to refer to the increased glucose content of the blood as "high blood sugar," and to the glucose in the urine as "sugar in the urine." Glucose, however, is not the same substance as ordinary refined sugar (sucrose). It would be more accurate to say "glucose in the blood" rather than "sugar in the blood."

The primary cause of diabetes remains unknown. The only reasonably certain statement that can be made about it is that diabetes seems to occur in persons who have inherited a predisposition to the disease. The actual appearance of symptoms may begin at any time in life. When diabetes does develop, the patient's physician normally restricts the intake of carbohydrates, including sugar, to lower the glucose level in the blood.

Neither sugar nor carbohydrates in general are regarded by medical textbooks or medical authorities as immediate causes of diabetes. Those who advance this claim base it on the observation that the death rate from diabetes and the level of sugar consumption have both risen during the past century. They also note that in certain countries where sugar consumption is low the death rate from diabetes is correspondingly low.

In actual fact, the diabetes death rate may or may not parallel sugar intake. In the United States, for instance, annual sugar consumption per capita has varied little during the past 45 years. The diabetes death rate, on the other hand, showed a general decline from 1949 to 1955 and a general increase, year by year, from 1956 to 1969. In Cuba, where sugar consumption is high, death rates from diabetes are low.

Isn't the rise in the blood sugar level after eating sugar followed by a "letdown"?

In the normal person, the glucose level of the blood rises within 30 to 60 minutes after food is eaten. Sucrose provides energy very quickly — the glucose level (blood sugar) rises within one to five minutes after ingestion. The level returns to normal within two hours. This sequence of increase followed by decrease is called a food tolerance curve.

A "letdown" occurs when the blood sugar level drops well below normal after a meal. This may be caused by any of a number of *disorders,* such as hypothyroidism, hypopituitarism, Addison's disease, early diabetes, or the metabolic effects of liver damage. The tolerance curve produced by sugar is not significantly different from the curve produced by starch, bread, glucose or other carbohydrates.

Does eating sugar lead to hypoglycemia?

The subject of hypoglycemia has received a great deal of publicity in recent years. The effort to "popularize" this disease has resulted in large amounts of misinformation and false impressions suggesting that it is a major ailment. A recent magazine article stated that no fewer than ten million Americans have hypoglycemia. This would make it twice as prevalent as diabetes.

In fact, hypoglycemia is an infrequent condition. It is caused by the too-rapid movement of glucose out of the blood, or too little entry of glucose into the blood. It is believed that functional hypoglycemia is due to an overproduction of insulin by the pancreas. This abruptly lowers the blood sugar level. Usually the intake of a prescribed amount of sugar will relieve all immediate symptoms. The proper treatment of hypoglycemia is to increase the number of daily meals so that the intake of sugar and starches can be evened out.

Few people who experience fatigue, faintness, irritability or other complaints are suffering from hypoglycemia or low blood sugar levels, despite the dire warnings of medical alarmists. Sugar is no more the cause of hypoglycemia than roast beef is the cause of indigestion.

A major medical publication on the subject stresses that hypoglycemia is not a disease, but a defect in the complex mechanisms that maintain blood sugar levels. Generalizations about its causes and mechanisms, its author concludes, "are to be avoided."

Does eating sugar rob the body of B vitamins?

A group of animal experiments indicated that less B vitamins are required when starch is eaten, and more when sugar was eaten. This was interpreted to mean that sugar destroyed the effect of B vitamins. It was subsequently discovered that the experimental animals have another source for B vitamins (coprography). Although one of the original researchers has admitted that the significance of the original experiment was

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Donald R. Hefner (left) is shown receiving from the Chamber's Farm-City Banquet chairman Al Blanchard, a plaque honoring him as "Agri-businessman of the Year." Randy Reiff (right) was designated Outstanding Young Farmer at the same banquet.

Hefner Honored By Chamber Of Commerce

Ronald R Hefner, District Manager for Spreckels Sugar in District III, Woodland, was recently honored as "Agri-Businessman" of the year by the Woodland Chamber of Commerce. The award was made to Hefner at the Chamber's annual Farm-City banquet.

Hefner is a native of Orland, California, and majored in Agricultural Education at the University of California at Davis. After serving as an officer in the Air Force in World War II, he returned to Woodland and went to work for Spreckels Sugar Company, where he has remained employed, except for a brief period from 1950-53 when he supervised farm loans for Crocker Bank in Sacramento.

Another recent honor came in July of 1971 when he was designated "Outstanding Citizen of Year" by Woodland Jaycees.

Hefner has a string of community activities to his credit. He is chairman of the city of Woodland's personnel committee and a past president of the Woodland Chamber of Commerce. He is a trustee of the Woodland Memorial Hospital Foundation, former chairman of the public relations division for Woodland Memorial Hospital, and was a division captain in the fund drive for the hospital. He has served on the Woodland High School FFA advisory council and was formerly a member of the Winters FFA advisory council.

He was team captain for the Woodland Stadium Boosters Club, Inc., is a past president of the YMCA and was the Y's "Man of the Year" in 1968. He worked on the Nelson Grove development and assisted in starting the Babe Ruth program in Woodland for which he served as treasurer and manager for a long period of time. He served as a past president of the Babe Ruth League, and has been active in Woodland Chamber of Commerce committees, including the agricultural committee.

Hefner is also a member of the Yolo County Historical Society, Farm Bureau, Mental Health Society, Sheltered Workshop, U.C.D. Library Association, United Crusade Committee, Family Service Agency, past president of the Yolo County Council of the Girl Scouts, and a former member of the Commonwealth Club of San Francisco.

Hefner and his wife, Lucille, have four children and reside in Woodland.

RICHARD W. PEES

New Supervisor Appointed For Grower Accounting

Richard W. Pees was recently promoted to Supervisor of Spreckels Sugar Division's Grower Accounting Section in the San Francisco office.

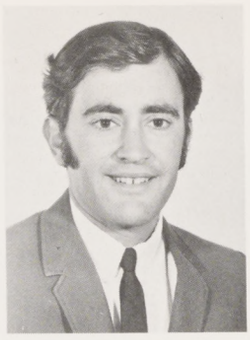
He replaces James F. DeLong, who has been transferred to the Cost Accounting Department where he will develop accounting procedures and controls for the company farming and land leasing operations.

Dick was raised on a small farm in the Kenton, Ohio, area and is a graduate of Ohio State University where he majored in Agricultural Economics. He spent four years in the U. S. Navy before starting to work in the Grower Accounting Section in February of 1971. He served a tour of duty in Vietnam and attained the rank of Lieutenant before his active duty was completed.

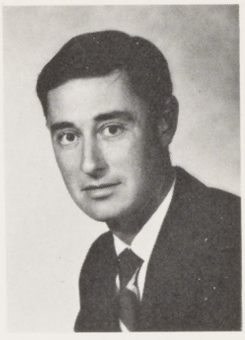
Dick is single and lives in Tiburon, California.

Dick Pees, new head of grower accounting section.

New Staff Additions At Chandler And Woodland



William R. Bassi



Kevin G. Melluish

William R. Bassi recently joined Spreckels agricultural staff at Factory 3, Woodland as an Assistant Field Superintendent. He will work with the agricultural research and field staffs.

Bill is a native of Gonzales, California and attended Palma High School. He graduated from Hartnell Junior College and the University of California at Davis with a major in soil and water science. Bill is single and now resides in Woodland.

Kevin G. Melluish is the newest member to Spreckels Agricultural Department in Arizona. As an Assistant Field Superintendent he will assist in company farming operations at Willcox.

Kevin is a native of Salinas, California where he attended Palma High School. He also attended California State Polytechnic College at San Luis Obispo where he majored in Agricultural Business Management.

Kevin is a member of the National Guard, is single and resides in Willcox, Arizona.

DISEASE AND WEED CONTROL

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planting and harvest schedules within an area so that no overlap of the old crop and the new crop occurs. To be effective, this break between successive crops or "beet-free period" should be long enough to permit the complete destruction of all vegetation from the preceding crop. This break can be achieved in Arizona more easily than in other beet-growing regions because Arizona's harvest in the Salt River Valley occurs during the high temperature period. Consequently, only a thorough and timely tillage is required to insure the prevention of this serious disease. An effective beet-free period, accomplished by the joint efforts of many individuals and agencies, was most effective in the fall of 1970 and again in 1971. Thus the improvement in the recently harvested 1971 summer harvested crop and the healthy condition observed in the present crop scheduled for harvest next June and July.

WEED CONTROL

Weeds have been and still remain a serious problem for Arizona beet growers. The crop in the Salt River Valley is unique in that it must contend with three seasons of weeds - summer annual weeds that emerge with the beets in September and early October, winter weeds mostly volunteer grains, annual grasses and some broadleaf species and the weeds that re-infest the field in the spring before harvest starts. This complex pattern of weed occurrence is difficult to overcome without using some of the excellent herbicides that are available for sugarbeets. The problem is that no single herbicide has yet been completely effective against the broad spectrum of weeds that can plague the crop between planting time in September and harvest the following spring.

Research trials conducted by Dr. Charles Stanger, Spreckels Agronomist, and Stan Heathman, University of Arizona Extension Weed Specialist, have been encouraging. Ro-Neet at low rates (two pounds per acre) has been encouraging for some growers who plant early in September, but growers planting in late September and early October can perhaps make better use of the post-emergence materials, such as Betanal or a new compound "EP475".

Last winter an old standby material, IPC, gave spectacular results against volunteer grain and winter annual grasses at very reasonable costs. This material is available for commercial use this winter as are Ro-Neet, Betanal, and Pyramin, which gives results approximating Betanal. Pyramin, however, may be more beneficial during the cold winter months than it is during the fall.

The weed problems in Arizona are a long way from being solved, but definite progress is being made in all of Arizona's beet-growing areas.

TABLE 2

COMPARISON OF FINAL BEET STANDS AND LABOR COSTS FOR THINNING BEETS TREATED WITH PRE-PLANT HERBICIDES

CHANDLER, 1971

Treatments	Rate #/Ac.	Beet/100' of Row	Thinning Time Hrs./Ac.	Thinning Cost/Ac.
Ro-Neet	2	138	10.1	$20.20
Tillam	2	138	9.9	19.80
NC8438	2	137	7.7	15.40
UP27267	2	140	9.9	19.80
Check	—	130	19.8	39.60

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SUGAR AND HEALTH

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overestimated, food faddists continue to claim that sugar "robs the body" of B vitamins.

Doesn't sugar slow down the absorption of calcium?

Popular nutritionists sometimes make this claim, based on the contention that sugar stimulates production of alkaline digestive juices which render calcium insoluble before it can be absorbed in the intestine. Actually, calcium is always a highly inefficient process, because calcium tends to combine with many elements that appear in the intestine, forming insoluable phosphates, carbonates, oxalates, sulfates, or soaps. Normally, only ten to twenty per cent of calcium present in food is absorbed, and the remainder is excreted unused. In this vast normal "wastage" of calcium, the role played by sugar can only be a small part of the whole.

Why is sugar accused of supplying only "empty calories" to the diet?

The term "empty calories" is applied to white refined sugar because it provides no nutrients other than carbohydrate. Users of this term are suggesting that all foods must be a source of several nutritional requirements, not just one, and that calories are relatively unimportant. An adequate supply of calories, as is known, is essential for health and work. In the United States, as in most developed countries, carbohydrate supplies 45 to 50% of total daily calories. Of this, sugar makes up 25 to 30% of total carbohydrate. As has been pointed out, it would be difficult to find substitute calorie sources if our supply of sugar was cut out or even cut down.

Sugar should not be faulted as a source of calories. It is one of our purest foods, and is so quickly digested in the body that it is available for energy use in a matter of minutes. The calories in sugar are no more empty than the calories in any other food. Calories, as a measure of heat and energy, cannot be anything other than calories, any more than inches can be anything other than inches.

The type and amount of nutrients contributed by foods vary considerably; some foods offer minute amounts of vitamins in addition to fats or carbohydrates. Canned pears, to take an example, offer carbohydrates and potassium, and extremely small amounts of other nutrients. Pears are not criticized for their paucity of nutrients.

Perhaps the soundest observation about "empty calories" is the nutritional fact that when a person eats foods that supply the daily requirements of carbohydrates, proteins, vitamins and minerals, the rest of the calorie quota can be filled from any food. What should be guarded against is to start with foods whose value is almost entirely in calories alone. The want of essential nutrients would be perilous.

Do we need sugar in our diet?

Nutritionists are in general agreement that about 50 per cent of our calories should come from carbohydrates, to supply the bulk of our energy needs and for other nutritional requirements. About one-third of the U.S. carbohydrate intake is sugar.

There is a psychological need for sugar. People enjoy it. They like to eat foods that are sweetened. It is sugar that adds to grapefruit's palatability, that enhances the flavor of salad dressings and soups, that increases the desirability of baked goods and dairy products, such as ice cream.

Infants and children usually need more calories than are supplied by milk, their main food. Foods containing sugar help to even out this requirement.

There is an economic need for sugar, too. Sugar provides more calories at lower cost than other common foodstuffs. In other terms, sugar cane and sugar beets provide by far the largest food yield when expressed as calorie per acre of land. If we could eliminate sugar from our diet, it would be difficult to make up the calorie loss with other foods.

EDITORIAL

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application of his product. On the other hand, the sugarbeet fieldman and grower are interested in producing the best crop in the most economical manner.

So, I can see why a grower might be so foolish as to not listen to the advice of his fieldman. Most fieldmen are aware of the influence the many crop doctors have on growers and are also aware of the fact that they too can have problems in trying to remain impartial. As a trainee I can foresee a difficult road ahead."

The preceding editorial was written by Gerald R. Kley, Assistant Field Superintendent, Spreckels Sugar Division, Chandler, Arizona.

SPRECKELS SUGAR BEET BULLETIN

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